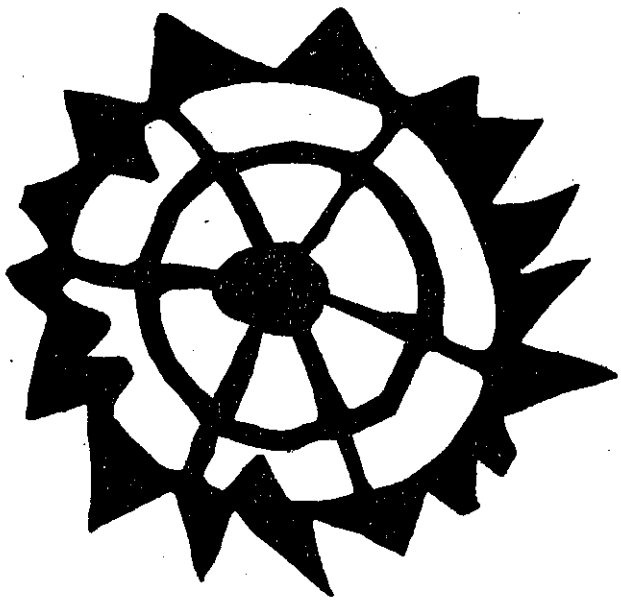
ARCHEOLOGICAL INVESTIGATIONS

at

WHALE ROCK RESERVOIR

Cayucos, California



by Fred M. Reinman

State of California
Department of Natural Resources
Division of Beaches and Parks
Interpretive Service

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Fred M. Reinman

ARCHEOLOGICAL REPORT

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ORGANIZATION

WILLIAM E. WARNE . . . . . Director of Water Resources

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ALFRED R. GOLZE . . . . . Chief Engineer

IRVIN M. INGERSON . . . . . Chief, Technical Services Office

LAURENCE B. JAMES . . . . . Chief Geologist

HAROLD D. WOODS . . . . . Coordinator of Archeological Investigations

This report was prepared under the direction of

FRANCIS A. RIDDELL, ARCHEOLOGIST

INTERPRETIVE SERVICES SECTION
DIVISION OF BEACHES AND PARKS
DEPARTMENT OF NATURAL RESOURCES
STATE OF CALIFORNIA

PREFACE

With the excavation of several archeological sites at Whale Rock Reservoir, San Luis Obispo County, the State Department of Water Resources began a program of preservation of archeological and historical values within those areas administered by the Department. The program is patterned from the Federal Government's River Basin Surveys, but is, understandably, confined to the State of California.

The fine job done by Fred Reinman, as presented in the following pages, was made possible by a contract to the University of California at Los Angeles, from the State Division of Beaches and Parks who administers to all of the Department of Water Resources' archeological needs by means of an inter-agency agreement. The Department's preservation program points up the cooperative spirit among State agencies, working with professional institutions, to preserve for the people of California their rich and varied historic and prehistoric heritage.

Francis A. Riddell, Archeologist
State Division of Beaches and Parks

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ARCHAEOLOGICAL INVESTIGATIONS AT WHALE ROCK RESERVOIR, CAYUCOS, CALIFORNIA

Fred M. Reinman

INTRODUCTION

This report is the result of an archaeological investigation carried out in the Whale Rock Reservoir under the terms of a contract between the State Division of Beaches and Parks and the University of California at Los Angeles. The work arose as a result of preliminary surveys made by Francis Riddell of the Division of Beaches and Parks and Marshall McKusick, formerly of the University of California. The field work was carried out under the direction of the author and was completed in two field sessions, one in June and the other in August of 1960. Crew members on the first trip were Steve Baham, Barbara Benkle, Dave Bonderman, Paul Buell, Ernie Chandonet, Emily Duncan, Les Frazin, Roger Nance, Louis Okin, Jeff Teal, and D. L. True. The second party included Steve Baham, Ernie Chandonet, Barbara Curran, Roger DeSautels, Robert Harshbarger, and George Kritzman.

In addition to the people employed in the field a number of individuals aided the project in many ways. Charles F. Beattie, the Resident Engineer, Department of Water Resources, and his assistant John F. Lawder proved invaluable and aided greatly in making the facilities of the work project available to us. Mr. George Renault also helped by providing camping facilities and in helping to expedite the work in a number of ways. Many of the employees of both the State and the contractor's crew aided in providing information about the area as well as contributing to the collections. They also helped in a personal way to make our stay a very pleasant one. A special thanks goes to Mr. Bruce Selkirk of Cayucos who not only was interested in our work, but personally conducted the author to several additional sites in this region.

The Region

Whale Rock Reservoir is located on the coast of San Luis Obispo County in a small valley in the southern portion of the town of Cayucos, California. This valley is one of several which run perpendicular to the coast in the area from Morro Bay to Estero Point. Each of these contains a major creek with several minor tributaries, many of which flow perennially. Their flow is considerably reduced in the dry summer months. These coastal valleys are intensively farmed areas at present, and in aboriginal times they evidently were also favored as habitation spots, providing both protection from the winds and fogs of the region and yet giving easy access to the resources of the sea and the surrounding hills and mountains. Two creeks, Cottontail and Old Creek, provide the main source of fresh water to the valley.

This valley, as well as others along this coastline, opens out on a relatively narrow terrace over which the present highway is constructed. This terrace ranges from a few feet to 40 or 50 feet above the present beach and has been

cut by the streams that issue from the mouths of the canyons. This terrace as well as the beaches provide a natural north/south passage along the coast one that was utilized by the early explorers and probably by the Indians as well.

The climate of the area is mild and cool, often with strong sea breezes and a wet coastal fog which only rarely penetrates very far into the valleys. During our work in this region, the inner valley was consistently free from fog while along the coast it was frequently found. Except for the midday hours, the temperatures remained cool. The rainy season is from November to April with little rain falling in the off season. In the rainy season the creeks are full and before the building of the many check dams in the valley, flooding must have been a problem, especially before the present creek beds were cut. These creeks are the probable source of the main portion of the alluvial fill of the valley which makes it a fertile farming region.

The vegetation is typically southern coastal in the few areas where it still remains relatively undisturbed. Canyon heads and steep areas that remained unused for farming still contain chaparral and live oaks. Small stands of live oaks are also found in gullies and on the sides of the valley (see Plates 1-3). Much of the original vegetation has been altered due to the extensive farming and stock grazing.

Early explorers passed this way several times and while no mention is made of any Indians being encountered, they recorded an abundance of wild life for the region which now comprises San Luis Obispo County. Species noted include the California grizzly, deer, elk, foxes, coyotes, wildcats, and the mountain lion. Smaller animals included squirrels, rabbits, rats and mice, shellfish, seals, and sea otters as well as many species of sea mammals. All of these were probably utilized to some extent by the Indians as well as using the wild plant foods that surrounded them in the hills and mountains.

The Site Area

There are 16 sites located in the surveyed area which extends for a little less than a mile and a half from the mouth of the canyon. These sites (SLO-148 to 163) will all be flooded by the waters impounded by the dam. The one exception to this is SLO-154, a large site located at the mouth of the canyon and partially destroyed in the construction of the spillway for the dam. The sites vary considerably in size, but at least 3 of them (SLO-154, 157, and 163) and perhaps others destroyed by the early work were of village size (Riddell, 1960, Table 1). Even allowing for the possibility that sites designated with separate numbers may actually represent a single area divided by the creek, the number of sites in so small an area is indicative of the favorability of this region as a supportive base for human habitation.

The sites themselves are easily recognized by the accumulations of stone artifacts, flakes and chips of stone, scattered shell, and by the growth of a large thistle which is found on most of the sites in this valley (see Plates 1a, 3a). Animal bone is scarce to entirely absent from the surface and comparatively rare in the midden excavations. All of the sites are located on the banks of either creek or only a very short distance from them. Three are

characterized by bedrock mortars (SLO-151, 153, and 155; Riddell, 1960:4) and portable mortars were found on most of the other sites. Other than the cobbles and pebbles of the stream bed, local outcrops of various types of cherts, basalt, and sandstone dot the sides of the canyon. Many of these are known to the local residents as "workshops" but the two that the author visited gave no indication of being especially utilized as quarries or chipping stations. No tools were found and the chips and flakes scattered about apparently are the result of natural weathering. No special pattern of the sites is apparent except that they were all on or near the streams with the major cluster occurring where the two creeks meet (see Figure 1). All apparently had access to the same resources and insofar as was noted, one area was not favored over another for settlement.

Following is a description of the sites excavated as well as a table and description of the artifacts. Where applicable, burials and faunal remains are also discussed.

DESCRIPTION OF THE SITES

SLO-156

SLO-156 is located at the confluence of the two creeks that flow through the valley; Cottontail and Old Creek. These streams must have provided the aboriginal inhabitants with an adequate supply of fresh water. The site itself is located on a small knoll that rises to a height of approximately 20 feet above the creek beds which flow to the East (Old Creek) and the West (Cottontail Creek) of the site. The surface shows evidence of the previous inhabitants in the scattered shell remains, chipped and ground stone tools, and in the darkening of the soil of the site area. Both creek beds contain sizeable amounts of smooth cobbles and pebbles that were obviously utilized by the Indians as a source of faw materials for tools. Outcrops of chert which dot the hills within a short distance of the site were also used.

Excavations revealed an upper and a lower midden separated by approximately 2 and one half feet of sterile sands and gravels (see Figure 2). The artifact yield was very slight in both middens and a comparison of the middens on the basis of the artifacts is not feasible. Some observations are necessary however. The materials used in the manufacture are the same, as would be expected since they are of local origin. The workmanship is crude. This is a characteristic of all of the tools recovered in our excavations. With the possible exception of the 2 knives from the lower midden, the tool types themselves do not differ sufficiently to warrant distributing them temporally on the basis of manufacturing techniques. Essentially they are the same. The artifacts, bone, and shell from the lower midden are generally covered with a heavy, limy deposit, probably the result of the high water table in this area rather than any specific indication of any great age of the midden. The upper midden probably represents a continuation of the lower midden, the intervening sterile layers being deposited as a result of flooding of the original site surface at a time of high water. They were probably quickly deposited, one on top of another in a fairly short period of time.

They may, however, represent a considerable lapse between the upper and lower middens. None of the layers distinguished in the soil profiles (fig. 2) show any erosional features, with the exception of the layer which forms the top of the old midden. At this level there is a definite break in the deposition and this is easily seen, both in the pit walls and in the face of the cut bank (Plate 2b). This bank is the result of the removal of the greater portion of the site for dam fill. The sharp line noted in the center of the photograph of this bank is a line of disconformity which represents the upper level of the lower tool bearing layers and the bottom level of the sterile layers of sands and gravels. These sands and gravels grade into the upper midden without any apparent line of demarcation. It is possible that this disconformity represents an erosional face which occurred after the lower midden was abandoned and midden debris ceased to be deposited.

A feature was found in the 78-90 inch level of Pit F-20 which consisted of a small group of stones resting on the floor of the level. A small fragment of a badly decomposed sandstone bowl was found in this feature. No other artifacts, bone, shell, or ash was noted. A second feature was removed at the same level (90 inches) from the face of the cut bank. This feature contained several hammerstones and a flake scraper made from a thin piece of chert, but no shells, bone or ash.

A total of 54 artifacts, plus an unmodified human femur and a worked whale vertabrae make up the entire collection of artifacts. Several pieces of ochre were also recovered. A total of 26 cubic yards of earth was excavated for an artifact yield of about 2 per cubic yard. Most of the artifacts are from the lower midden (31) with the remainder coming from the surface (7) and from the upper midden (16). A large area of the site was gridded, however time permitted only 6 pits to be excavated, 3 of which went down to the lower midden (F-20, 21, and 27). The deepest pits were excavated to a depth of 10 feet from the surface (see Plate 2c).

Faunal Remains

Very little bone was recovered from either midden, none of which was identifiable with the exceptions noted above. That found in the lower levels was decomposed and heavily encrusted. Some was also apparently water-worn. Shell remains were more plentiful than bone but still comparatively rare. Fifteen species of shell were identified as well as fragments of lobster and land snail shell. These are listed in the following table.

SHELL SPECIES FROM SLO-156

Common name	Scientific name
BIVALVES	
Pismo Clam	Tivela stultorum
California mussel	Mytilus californicus

Nuttall's Saxidome	Saxidomus nuttalli
Washington Clam	Schizothaerus nuttalli
Rock Venus	Protothaca staminea
False Wavy Chione	Chione simillima (?)

UNIVALVES

Red Abalone	Haliotis rufescens
Abalone	Haliotis sp.
Turban Shell	Tegula funebralis
Purple Olive	Olivella biplicata
Owl Limpet	Lottia gigantea
Limpet	Acmea sp.
Thais shell	Thais lima
Platform mussel	Septifur bifurcatus

OTHER

Barnacle	Balanus sp.
Lobster claw	
Land snail	Helix sp. (?)

All of the bivalves with the exception of the Chione simillima (represented by a single questionable fragment) are present in both middens. None are found below the 96 inch level with the exception of the Pismo Clam (Tivela stultorum) which is also found in the 96-102 inch level. Of the univalves, only the Barnacle (Balanus sp.) and the Black Turban shell (Tegula funebralis) are found in the lower midden. The rest were confined to the top 12 inches of the upper midden. Land snail (Helix sp. (?) was common throughout both middens, even being found in the intervening sterile layers. The fragments of lobster claw were confined to the top layer.

Stratigraphy

Soil profiles were made on the deep pits (F-20, 21 and 27) dug in this site. Two middens may be seen both in the pits excavated and in the cut bank left standing by the construction operations (Plate 2 a-c). The upper midden ranges from 2 to 16 inches in depth. This has also been subjected to brush clearing operations and the workers estimated that anywhere from 6 to 12 inches of the midden had been removed by this process. The lower midden began at a depth of 58 inches from the present surface and continued to a depth of approximately 96 inches. Below this was a layer of dark clayey sand, sterile except for scattered traces of charcoal. Underneath this was a layer of coarse sand and gravel and a layer of dark sandy clay, both sterile. The layers between the 2 middens are composed of river gravels and sands of varying degrees of coarseness (Fig. 2). The lower midden is in 2 layers (Fig. 1, E and D) the upper of which is composed of light tan, sandy clay and differs from the layer beneath it only in that the lower section is impregnated with lime. Both contain shell, tools, and scattered charcoal. A darker layer below this also contained charcoal impregnated clay, samples of which were collected for possible Carbon dating, but as yet this site has not yielded sufficient material from any one level to make dating possible.

The categories in the following chart* were determined in the field by observation and are based on the textural qualities of the soil. The sands and gravels were assigned arbitrary categories on the basis of size relative to each other while the clayey sand and sandy clay categories were based on the feel of the soil. If it was compacted and felt smooth but slightly granular it was called clayey sand. If on the other hand it was quite granular but still retained a feel of clayey smoothness it was called sandy clay.

Artifact Description

Artifact counts and measurements are given in Table 1. A total of 54 stone artifacts were recovered as well as an unmodified human femur and a worked whale vertabra. With few exceptions, the stone work is crude and erratic in pattern. Precussive rather than pressure flaking methods appear to be the most common. Comments on the collection are in the same order as their appearance in the table.

Stone Artifacts

CHIPPED STONE OBJECTS

Chopper; A large chopper of basalt made from a water-worn cobble was found on the surface of the site. It had a natural, wedge-shaped end from which a few flakes were struck to sharpen it for use (Plate 4s).

Hammers; In this category are several core fragments as well as small nodules of chert that have been used as hammers. These all come from the lower of the two middens and were found in the 72-90 inch layers. Two of the 3 were found in the feature in the face of the road cut at the 90 inch level, while the third comes from Pit F-27 (Plate 4t).

Scrapers; Three scrapers were found. They have been differentiated into the following types;

1. Flake scraper. This is a large crude flake of chert with naurally sharp edges that have been slightly retouched in the thickest areas. This was found in the 78-90 inch level of Pit F-20.

2. Small domed scraper. This small artifact has been fashioned from what was probably a piece of core trim, removed to prepare a striking platform. It was then slightly retouched on one edge to form a scraper-plane-like implement (Plate 4i).

3. Serrated scraper. This implement is made from a thick flake whose edges have been trimmed for thinness and then 3 relatively deep flakes removed with a hammer to give the flake a saw-like edge (Plate 4h).

Knife; Three knives were found in the deep midden, 2 from Pit F-20 at the 66-78 inch level (73 and 75 inches deep) while the third was recovered from the feature in the face of the cut bank at the 90 inch level. All are crudely percussion chipped into shape and with the exception of the smaller

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* See Figure 2.

of the 3, are made from heavy flakes of chert and jasper. The small knife, found in the cut bank, is made from a thin, tabular piece of tan chert (Plate 4a-c).

Drills; A small fragment of a stone drill was found on the surface of the site at the base of the road cut. It is made of banded chert (Plate 4g).

Reamer; A triangular piece of chert with all 3 edges worked has been classed as a reamer and was probably used to enlarge holes drilled in bone, wood, and shell (Plate 4f).

Blades; Two blades that have been struck from a prepared core were also found. Both have their edges retouched by pressure flaking. They are thick in relation to their length and are trapezoidal in cross-section (Plate 4k).

Flakes; Eight used flakes were found. All were probably used once or twice and then discarded. They were probably fortuitously shaped when struck from the core and retouched only enough to thin areas that were too thick to use as cutting edges. Four of these were from the lower midden (Plate 4d, e).

Split cobbles; Two split cobbles were found in the upper part of the midden and on the surface. Both have been used as hammerstones and are made from half of an elongated, slightly flattened beach or stream cobble (Plate 4r).

Cores; Twelve cores of various sizes were saved, most of which (9) came from the lower midden. One (Plate 4m) shows signs of possible secondary use as a scraper; all of the others are unmodified (Plate 4l-o).

Pebble; In this category is a small quartz pebble that has been chipped on one edge as if to sharpen it. It does not however, form a good cutting edge and therefore has not been classed as a scraper.

Miscellaneous unidentified; Ten small flakes and 4 possible cores or hammers were also catalogued from the lower midden. All have been water-worn and are lime encrusted.

GROUND STONE OBJECTS

Bowl; A wedge-shaped fragment of a badly decomposed sandstone bowl was recovered from Feature 1 (Plate 2d) which rested on the floor of the 90 inch level of Pit F-20. The fragment is thick, with a rounded rim and appears to have been a rather open, shallow bowl with a flat bottom (Plate 4p).

Unidentified; Included in this group are a sandstone fragment of unknown use with one edge pecked and ground. It might possibly be a fragment of a large pestle (Plate 4q). The other object is a small basaltic pebble, tear-drop in shape, with one edge ground on a diagonal and the lower half pecked all around the edge (Plate 8j). It also exhibits a shallow pit on the body. This is one of 4 recovered from the surface of 3 sites (SLO-156, 158, and 159). All are remarkably similar in size, shape, and workmanship. Two of the 4 are

bifacially pecked on the body of the artifact.

MISCELLANEOUS OBJECTS

Ochre; Twenty small pieces of red and yellow ochre were found in the course of excavating the pits. Ochre appears to have been quite common on all of the sites.

BONE OBJECTS

Drilled vertabra ; A single whale vertabra was found on the surface of the site. It has been badly decomposed by exposure to the elements as well as possibly being burned. In one side are drilled 9 holes of varying depths (2.1 cm. to 8.2 cm. deep) while on the opposite side are 2 smoothly worn grooves that appear to be the result of use as a whetstone for grinding shells or bone (Plate 8a).

Unmodified femur; An unmodified human femur was also found on the surface of the site.

Table 1 Inventory of Artifacts From 4-SLO-156

ARTIFACT TYPE	NO.	MATERIAL	MAX. SIZE (in cm.)			MIN. SIZE (in cm.)		
Chipped Stone								
Chopper	1	Basalt	19.0	8.8	5.6			
Hammers	3	Chert, jasper	10.0	8.3	3.5	8.5	6.2	4.6
Scrapers								
large flake	1	Chert	7.5	6.3	1.7			
small domed	1	Chert	3.7	3.4	1.5			
serrated	1	Siliceous shale	4.2	3.2	1.6			
Knife	3	Chert, jasper	8.7	4.0	1.8	3.4	2.9	0.9
Drill	1	Chert	2.9*	1.0	0.7			
Reamer	1	Chert	4.3	1.4	1.4			
Blades	2	Chert	4.0	1.9	0.9	3.1	2.3	0.8
Flakes, retouched	8	Chert, jasper	4.4	3.2	0.8	2.5	0.5	0.4
Split cobbles	2	Basalt, granite	9.5	7.5	3.2	6.8	6.9	3.7
Cores	12	Chert, jasper chalcedony	various sizes					
Flakes, unmod.	10	Chert						
Pebble	1	Quartz	2.8	1.8	0.9			
Unidentified	4	Chert, siliceous shale	7.9	4.7	3.6	6.2	4.7	3.4
Ground Stone								
Bowl	1	Sandstone	---	---	3.7*			
Unidentified	2	Sandstone, basalt	7.6	5.2	2.6	7.4	4.0	1.8
Miscellaneous Objects								
Ochre	20	Red and yellow						
Bone Objects								
Drilled vertabra	1	Whale bone	20.5	20.2	11.4			
Unmodified femur	1	Human	40.4	---	---			

* designates imcomplete specimen

SLO-157

SLO-157 is a fairly extensive site located on a point of land that is formed by a bend of Cottontail Creek swinging to the east from its usual southerly direction. The site is about 200 by 200 yards in area and runs along the creek bank in a level field 20 to 30 feet above the bed of the creek. Portions of the western edge of the site have been destroyed by undercutting of the stream (Plate 3a, b). The field and the site have been extensively distrubed down to almost the 18 inch level because of sub-soiling prior to the growing of sugar beets as well as being plowed for other crops. It has also been used as a pasture for cattle and horses. Numerous artifacts and fragments of stone and shell are to be seen on the surface and indicate that this was probably one of the more extensively used habitation areas. The creek bed at this point contains numerous cobbles and pebbles that must have served as raw materials for the aboriginal inhabitants.

Thirty pits plus a large trench excavated by a bulldozer were put into the site. The deepest levels of the midden were encountered along the edge of the cut bank on the west side of the creek (see Fig. 4). All of the burials found were also in this area. Pit K-6 produced the deepest midden, at 37-39 inches in depth. This lower level also produced a Carbon 14 date of 1620 + 80 years BP (LJ-236). The date was run on Pismo Clam shells (Tivela stultorum) found in the 36-42 inch level. The midden along the creek bank averaged 30-36 inches in depth and gradually decreased with distance from the edge.

A total of 739 objects were recorded in the field catalog. Of these, 699 were stone artifacts, 2 were of bone, and 11 were shell. Twenty-seven foreign objects (of non-Indian manufacture) were also catalogued. Approximately 80 cubic yards of earth were removed from the site to give an artifact yield of about 9 per cubic yard. This is comparatively high for this area. The other sites averaged less than 2 artifacts per cubic yard.

Features

Four small stone features were recorded from this site. All consisted of small groupings of stones at various levels. Only 2 artifacts were found in these features, and Burial 4 was located beneath Feature 2 in Pit K-6. Following is a brief description of each of the features encountered.

Feature 1: This feature is located in the 18-24" level of Pit I-8. It consisted of a small group of stones at the 20 inch level without any significant orientation to their grouping. A large chopper (292-479)* was found in this feature. No bones, charcoal, or ash was found.

Feature 2: This feature occurred in Pit K-6 at the 30-36 inch level and constituted the burial cairn for Burial 4. Several artifacts were found in this group: a pitted stone (292-33); a small hammer (292-85); a split cobble (292-86); and a worked blade (292-537). The feature was a loosely scattered layer of stones that covered most of the eastern half of the pit and extended into the adjoining pits (Plate 3d).

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* Numbers refer to field catalog number of item.

Feature 3: Located in Pit EE-16 at the 12-18 inch level. This small feature of loosely scattered rocks contained one artifact, a serrated scraper (292-374). Nothing else was found in association with it.

Feature 4: This feature was located in Pit DD-15 at the 24 inch level. No artifacts, shell, bone, or charcoal were in association with it.

Faunal Remains

Bone and shell remains were relatively scarce, but because of the extent of the excavations a number of shells was recovered. A small sample of animal bone was also catalogued. In the lower layers the preservation was poor, and much of the shell was represented by small pockets of white powder or a greyish white streak in the midden. Since time and the condition of the midden did not make screening a feasible operation, no attempt has been made to arrive at figures of the relative abundance of the various species in the different levels and pits. The sample will only serve to indicate the types of shell fish utilized by the aboriginal inhabitants.

Thirty-three species of shell were recovered from the various pits in the site. Following is a list of these that have been identified.*

SHELL SPECIES FROM SLO-157

Common name	Scientific name	Depth (in inches)
BIVALVES		
Pismo Clam	Tivela stultorum	0-42"
California mussel	Mytilus californicus	0-42"
Nuttall's Saxidome	Saxidomus nuttalli	0-36"
Washington Clam	Schizothaerus nuttalli	0-42"
Rock Venus	Protothaca staminea	0-42"
Bent-nose Clam	Macoma nasuta	0-42"
False Wavy Chione	Chione simillima	0-18"
Rock Borer	Philadidea sp.	12-24"
Razor Clam	Siliqua sp.	18-36"
Cockle	Cardium sp.	0-30"
Smooth cockle	Chione fluctifraga	12-18"
California oyster(?)	Ostrea lurida (?)	18-36"
UNIVALVES		
Abalone	Haliotis sp.	0-42"
Red Abalone	Haliotis rufescens	0-18"
Black Turban shell	Tegula funebralis	0-42"
Purple Olive	Olivella biplicata	0-42"
Owl Limpet	Lottia gigantea	0-42"
Limpet	Acmea sp.	0-36"
Moon Shell	Polinices sp.	12-24"
Slipper shell	Crepidula adunca	12-36"

* The shell species were identified by the author and Jack Smith of the Dept. of Anthro-Soc. at UCLA using the type collections of the department.

Platform mussel	Septifur bifurcatus	0-18"
Keyhole Limpet	Fissurella volcano	0-12"
Giant Keyhole Limpet	Megathuria crenulata	0-18"
Thais	Thais lima	0-42"
Thais	Thais sp. (?)	18-42"

OTHER

Barnacle	Balanus sp.	0-42"
Chiton	Tonicia sp.	0-36"
Lobster claw		0-30"
Land snail	Helix sp.	0-24"
Coral	Coral sp.	0-12"
Stingray spine		18-24"
Inidentified		36-42"

*

A few pieces of identifiable bone were also recovered. These included deer, seal, squirrel, rabbit, and the pocket gopher. Their scarcity seems to indicate that hunting was only one of several sources of food for the population, and not a major subsistence focus.

Burials

Four burials were recovered from SLO-157, three during the excavations and 1 in the preliminary survey of the site by McKusick and Riddell (Riddell, 1960:5). Three of the burials were resting in pits that had been dug through the midden and a few inches into the subsoil. Burial 1, according to McKusick's field notes was found eroding out of the cut bank that forms the northwestern edge of the site (see Fig. 2a). It was apparently lying face down with the skull in a westerly direction and at a depth of 34 inches. Most of the body was missing with only fragments of the skull, clavicle, and a few of the rib bones remaining. The skull was badly crushed, apparently from earth pressure. A few stone flakes were noted in the vicinity but were felt to be in the general midden refuse rather than in direct association with the burial.

Burial 2 was found in Pit K-5 (Figure 2c) in the vicinity of burial 1. As was burial 1, this also rested on the subsoil base at a depth of 30 inches from the surface. The remains were badly broken and could not be identified as to sex; age was determined on the basis of unerupted permanent canines and incisor teeth. A few rocks which may have formed a cairn were associated with the burial. Directly above the burial was a complete pestle (Fig. 2c) which apparently was associated with the burial. If so, this is the only artifact associated with any of the burials with the exception of a possible crudely worked flake scraper found with Burial 4.

Burial 3 was found in Pit F-7 at a depth of 16 inches from the surface. It is represented by a small scrap of the skull, 1 milk tooth, and a few small fragments of a femur (?), rib bones, and a humerus. All are very small and probably are the remains of a fetus burial, or a very young child.

Burial 4 was found in Pit K-6 at a depth of 31 inches from the surface. It also rested on the sterile subsoil of the site. (Figure 3d, e). This burial had a scattered rock cairn associated which nearly covered half the

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* See Appendix 1

floor of the Pit (see fig. 3d). As this was being removed the skull and mandible appeared. The remains were badly broken and could not be sexed; again age was determined on the basis of the unerupted permanent teeth. Associated with the burial and in the head region were two fragments of Haliotis shells, both of which were unmodified. A series of Pismo clam shells (Tivela stultorum) from the basal level (36-42 inches) yielded the C-14 date.

The following chart summarizes the data obtained on the burials. All remains are stored in the UCLA Museum, including Burial 1.

BURIAL	DISPOSAL	POSITION[a]	ORIENTATION	AGE[b]	SEX	DEPTH[c]	ARTIFACTS
1	Primary	TF	east/west	?	?	34"	None
2	Primary	TF	north/south	child	?	30"	Pestle (?)
3	?	?	?	fetus	?	16"	None
4	Primary	TF	east/west	child	?	31"	Flake Haliotis shells

a - TF: Tight Flex b - Based on Hooton, 1946: 732 c - to top of skull

Artifact Description

Artifact counts and measurements are given in Table 2. A total of 739 artifacts were found on SLO-157, 699 of which are of stone. Only 2 pieces of worked bone were recovered, 11 shell beads, bead blanks, and a fishhook blank. Bone and shell was relatively scarce in the midden while stone chips and flakes of local cherts and jaspers were very numerous. Comments on the collection are in the same order as their appearance in the table in the table. More than 70 per cent of the artifacts are from the top 18 inches of the midden.

Stone Artifacts

CHIPPED STONE

Projectile points: A total of 24 were recovered from the site (Plate 5a-t). Of these only 2 were whole while 11 were classified into 2 types on the basis of form. Type 1 is a triangular shouldered point with a contracting stem. Type 2 is leaf shaped and is represented by only one specimen although undoubtedly some of the fragmentary specimens fit into this category as well. Thirteen additional fragments were unidentifiable. Weights of whole specimens (2) were 4.0 and 7.3 grams. Of the 11 points classified as to type the range in weight was 3.3 - 21.5 grams, with an average weight of 7.3 grams. Only 2 specimens were below 4.0 grams. Of the entire collection, 9 were below 4.0 grams (1.9 to 3.8 grams) while the remainder ranged from 4.0 grams to 14.8 grams with one specimen weighing 21.5 grams (Plate 2a). This large specimen still has asphaltum adhering to the base. Most of the points are crudely made, some are plano-convex in cross-section with unifacial chipping to form the edge. One specimen is decidedly curved in longitudinal cross-section (Plate 2d). The best made point is of obsidian and is a blade fragment found in the 30-36 inch level of the site. This closely resembles a point figured

by Wallace from Arroyo Grande (Wallace, 1959: Plate 2b), and would therefore also be classified as a Type 1 point. In looking at the distribution of the points by depth we see that 17 of the 24 points are clustered in the upper 18 inches of the midden. Seven of the points are found below this to a depth of 36 inches. Of these 5 and possibly 6 are classed as Type I points while the seventh is a large triangular point fragment (11.7 grams) with both tip and base broken. On the basis of this small sample, then, Type 1 points would seem to precede the others temporally but continue to be found in the uppermost levels. Several of these points are very similar to those figured by Rogers for his Hunting Culture (Rogers, 1929, Plate 59) and may represent the residual remains of this technique of point making surviving at a later time in a distinctly peripheral area.

Distribution of Points by Depth

TYPE	SURFACE	0-12"	12-18"	18-24"	24-30"	30-36"	TOTAL
Type 1	-	4	1	1	4	-	10
Type 2	-	1	-	-	-	-	1
Unidentified	1	7	3	-	1	1	13
Totals	1	12	4	1	5	1	24

Choppers: Six large pieces of stone have been classified as choppers (Plate 7d, e). All have large flakes removed from opposite sides of the nodule to form a crude cutting edge. One side is left in its natural state or has a few flakes removed to facilitate holding the implement in the hand. One of these is of sandstone and may have been used as a saw (Plate 7d).

Hammers: Twenty-one stone tools have been classed as hammers (Plate 7e, f, n). These range in size from large, unwieldy cobbles that must have been used for only the crudest work to smaller, deliberately shaped pecking stones. Many of the implements in the other categories also exhibit secondary usage as hammerstones.

Scraper/choppers: In this category are 9 large flake and core scrapers whose size is such that they may have been used as either scraper or chopper. Two of the specimens are unifacial and 7 are bifacial. One has asphaltum adhering to its surface (Plate 6n-q).

Scrapers: In this category are included a large variety of types distinguished on the basis of shape, size, and presumed function. Most are crudely fashioned from local materials. One hundred and twenty-two are classed in the following catagories:

> Large Flake: 23 large flake scrapers of various shapes. 17 are bifacial while 5 are unifacial (Plate 6w-y). This latter group have utilized a flake scar to give a relatively flat side with the opposite side retouched.
>
> Small flake: Fourteen small, rounded flakes, worked entirely around their circumference are in this category. With 2 exceptions these are all small enough to be called "thumbnail scrapers". One is of obsidian and is the best worked in the group. This is the only other obsidian artifact in the collection.

End scraper: Seven trapezoidal flakes with the larger end chipped unifacially to form a cutting edge are in this group. (Plate 6aa, bb)

Notched: Four specimens in this category are fashioned from a small flake with a natural point. A large chip has been removed from just behind this point and then the edge is carefully retouched to form a unifacial scraper with a notch (Plate 6ff-ii).

Nosed: Three artifacts are made from a heavy tabular flake, usually with 2 straight sides and one round side. At the long juncture of a flat and round side the flake is unifacially chipped to form a snub-nosed scraper (Plate 6v).

Tabular: In this category are scrapers that are flaked to form scraper planes with relatively parallel top and bottom surfaces. Three of the larger specimens have a small gouge-like projection made on a natural point that has been further delineated by removing a large chip on either side of the point. This area has then been additionally retouched (Plate 5pp-rr).

Small domed: This category differs from the above only in that the shape of the finished artifact is domed rather than tabular. The manufacturing process appears to have been essentially the same, including a number with small gouge-like projections (Plate 6t, u).

Serrated: Three small irregular flakes have been worked into a saw edge by removing a series of large chips at regular intervals along the sharpened edge. These are all unifacially worked and may have been used to saw small bones and pieces of shell (Plate 6z).

Pointed end: This category includes 17 irregularly shaped flakes that have as a common characteristic a natural point retouched to a fine point that could have been used as a graver or scraper. In some specimens only this point shows evidence of having been reworked while others are retouched all along one edge (Plate 5y-bb).

Rounded end: This category differs from the above only in that the worked point is much broader and rounded rather than pointed, and is more suitable for gouging (Plate 5cc-ff).

Knives: In this category are 3 heavy, crudely shaped flakes that could have been used as knives or are perhaps unfinished blanks (Plate 6s). Also included are 9 fragments, bifacially retouched, that have been classed as knives (Plate 5u-x). These are relatively well finished and one specimen (Plate 5w) has asphaltum adhering to it. Also included are 4 chipped slate knives or scrapers (Plate 5gg-hh).

Drills: Twelve drills and microdrills were found, 10 in the 0-12 inch level and 1 each in the 12-18 inch and the 18-24 inch levels. Most of these have had the points broken off (Plate 5ii-kk).

Reamers: These are made from flakes, triangular in cross-section, on which all three edges show signs of having been used. They were probably used to enlarge and smooth holes in wood, shell, and bone (Plate 5ll-oo).

Blades: 99 blades struck from prepared platforms were found. In cross-section they range from rectangular to square, trapezoidal to triangular. A large number of them have had one or both edges retouched (Plate 5ss-b). Several recent papers have dealt at length with the use of blades by the California Indians, expecially in the Chumash area (Kowta, 1961; Schwartz 1960; Schwartz, 1959). Most of the blades from this site are trapezoidal or triangular in cross-section.

Flakes: 284 retouched flakes of various shapes and sizes were also recovered. Most of the flaking is erratic and of the kind used to extend a length of cutting edge on a naturally sharp flake or to sharpen a thickened portion of an otherwise sharp edge. None of these flakes could be included in the other categories on the basis of shape or presumed function. Most were probably used once or twice and then discarded.

Cores: In this group are 61 artifacts divided into 4 categories. All are of cherts and jaspers and only 8 exhibit a prepared platform. Many show secondary usage as hammerstones. Following is a brief description of the 4 categories:

> Cores: In this group are 31 fragmentary stones that represent the remains of cores from which presumably blades have been struck in a rather haphazard fashion. None of these show any signs of preparation, but are nodules that were struck wherever a face presented itself for striking off a blade.
>
> Retouched cores: In this category are those fragments that appear to have been reused secondarily as scrapers or choppers. Some have also been used as hammerstones.
>
> Tabular cores: Three cores were found which are characterized by essentially parallel sides utilized as platforms for the striking of blades from the core. In one instance the natural surface of the material has been utilized, while the other 2 have had the platform prepared by striking off a few flakes (Plate 6cc).
>
> Platform cores: This type has a single prepared platform from which the blades were struck (Plate 6dd, ee).

Unidentified: Two slate artifacts formed from a relatively long, narrow piece of slate, were also found. One (Plate 6r) looks very much like a wedge, while the other is shorter in relation to its width. Both are trapezoidal in cross section.

Ground Stone

Bowls: Nine fragments of stone bowls were found. Four of these were rim fragments. Two were square rimmed with both sides of the bowl being ground smooth. The larger of the two appears to have been especially well made with a slight indentation just under the lip of the bowl. It was of

relatively uniform thickness throughout. The other rims are rounded with the smaller of the two also being ground on both sides. One is probably a paint mortar since the bowl is very small and made of soft siltstone. One body sherd of a small bowl has been pierced with a hole, possibly in an attempt to mend it. This is a conical perforation from the inside of the bowl (Plate 7g). Evidently many well made bowls were recovered from other sites during the removal of earth for dam fill. Several workers described them as having been with burials, and some were apparently decorated with shell bead inlay work. Four of the better bowls were seen personally by the author, and although none were decorated all were large and well made, ground on both inside and outside. A small flat area was ground diagonally into the side of the bowl so that it could be rested on that side. The bottom remained rounded.

Pestles: Six whole and fragmentary pestles were recovered, one in possible association with Burial 2 (Figure 6c). With two exceptions all are made with a minimum of alteration. One specimen has the small end ground (Plate 7b). Another from the 24-30 inch level of Pit I-8 also has one side ground flat and a small pit pecked into another side (Plate 7a-c).

MISCELLANEOUS

Pitted stones: Twelve sandstone cobbles with uni- and bifacial pitting were found. One specimen from the burial cairn of Burial 4 had a double pit on one side and single pit in the other (Plate 7i). Most are formed from half cobbles and the pits are centrally located. These are presumably for finger grips. Two specimens are made from small round cobbles and may have been used as pecking stones (Plate 4h-k). Pitted stones are widespread in California in both early and late sites and must have had a similar function in both time periods. They were probably used to crack shells and acorns and perhaps to pound the tougher varieties of shellfish like the abalone (Meighan, 1959:396).

Split cobbles: Three small chert and basalt pebbles or cobbles that have been split and were probably used as pecking stones.

Netsinker (?): Two small sandstone cobbles that have a groove pecked around one end were found. Both are broken at the groove, and it is assumed that the groove was once centrally located (Plate 7m).

Whetstones: Two small siltstone fragments with a V-shaped groove presumeably formed in the process of sharpening tools upon them (Plate 6f).

Incised stone: This artifact is a flat, elongated pebble of siltstone which has had both sides decorated by a series of cross-hatched grooves scratched into it. This was found in the 30-36 inch level and was evidently broken in excavation, but the missing portion was not located (Plate 6a). These incised stones have been found in many sites and occur over a long time span. This particular specimen resembles one similarly cross-hatched which was found in Topanga Canyon in 1957 (Keith Johnson, personal communication).

Cobble: A long thin beach cobble, unmodified except for 4 small pecked holes in one side was found. Its use is unknown.

Flakes: This category includes 7 retouched flakes that could not be put

into the other categories. One is a small chip 2.4 cm. long with diagonal flaking across one face (Plate 6jj). Also included were 3 bipointed flakes (1.4 to 2.9 cm. long) that could have been used as gravers. Two small scrapers whose height exceeds either their length or width are also in this group. Both are pointed and one has a well worked notch in one side. A small quartz chip that has been worked into blade-like sharpness completes this group.

Blade: This implement is fashioned from a heavy blade with a triangular cross-section. One end of the blade is steeply flaked to form a flat bottomed chisel-like end scraper. Into this sharpened edge a deep notch has been chipped (Plate 6kk).

The remainder of the artifacts in this category include an unidentified piece of sandstone pecked along one edge; an unmodified quartz chip; two tarring pebbles; a small unidentified basalt pebble that possibly has both ends ground (Plate 6b); several pieces of red and yellow ochre; and an unidentified genera of Coral from the 24-30 inch level.

BEADS

Beads: Three steatite beads were found and 1 large bead made of siltstone. This latter artifact is made from a small pebble with the ends ground and is biconically perforated (Plate 6c). The steatite beads were both tubular and disk beads. The tubular bead is ciconically perforated as was one of the disk beads. The other is conically perforated slightly off-center (Plate 6d, e).

BONE ARTIFACTS

Bone artifacts were very scarce. Only two were found in the site, these being the only two recovered in all of the sites investigated by us. Unmodified bone was also comparatively scarce. This was probably due to a combination of poor preservation and to a lack of emphasis on hunting as a focus of subsistence activities.

Awl: One small tip of an awl was found from the top 12 inches of the midden. This fragment is only 1.2 cm. long but is incised on 3 sides with finely drawn parallel lines; 6, 7, and 8 lines are in each pattern.

Polished bone: A small piece of highly polished bone completes the bone artifact list from the site. This fragment is 2.9 cm. long and is made from a relatively thin piece of bone. There are no markings of any kind on it. Its use is unknown.

SHELL ARTIFACTS

Beads: Eight beads were recovered, the majority being made from Olivella shells. With one exception none were found below the 18 inch level. They have been divided into the following categories:

Spire-lopped: One bead made from an Olivella biplicata shell with the spire ground off was found (Plate 6l).

Side ground: A single side ground bead was found (Plate 6k). These beads are rather uncommon in the literature and are found only in

two sites to the author's knowledge: San Nicolas Island (Reinman and Townsend, 1960:17), and KER -74 (Riddell, 1951:18).

Disc: This type is made from the side of an Olivella shell and is Gifford's type X3b1. One of these was found in association (?) with burial 4 in Pit K-6 at the 30 inch level. (Plate 6j).

Circular: One clam and 1 Haliotis shell bead were circular with a central perforation. The clam shell bead was biconically perforated. A third fragment of Haliotis shell was also found and appears to have been circular when whole.

Bead blanks: Two bead blanks were found, both made from an unidentified species of clam shell (Plate 6h, i).

Fishhook blank: One fishhook blank (bead blank (?)) made from an Haliotis shell was also found. Two undeveloped siphon holes are seen in the fragment (Plate 6g).

FOREIGN OBJECTS

Several articles of non-Indian manufacture were recovered during the excavations. Most of these were nails (square) of the kind used for shoeing horses. Of the 27 objects found, 3 were found below the 12 inch level. These included a piece of white glazed chinaware from the 12-18 inch level, a square nail fragment and a broken knife blade from the 18-24 inch level. These latter three were probably deposited in these lower levels as a result either of rodent action or the extensive subsoiling that has taken place on the sites in this area that have been utilized for the growing of sugar beets. Also found were several fragments of a wooden fence post. These came from the pits in the vicinity of the edge of the cut bank (see Plate 3a) and probably are the remains of a fence that kept animals from straying over the edge.

Table 2 Inventory of Artifacts from 4-SLO-157

ARTIFACT TYPE	NO.	MATERIAL	MAX. SIZE (cm.)			MIN. SIZE (cm.)		
CHIPPED STONE								
Projectile points								
Type 1	10	Chert, jasper	7.2*	3.2	1.1	2.8	2.6	0.8
Type 2	1	Chert	5.1*	2.4	0.7	-	-	-
Unidentified	13	Chert, jasper, obsidian	5.0*	1.9	0.7	1.0	1.9	0.5
Choppers	6	Sandstone, chert, basalt, jasper	13.1	7.3	3.0	8.5	7.2	5.1
Hammers	21	Granite, basalt, jasper, chert, sandstone	20.0	11.6	7.0	3.4*	3.4	2.3
Scraper/chopper	9	Chert, jasper	10.0	6.8	3.3	7.1	5.9	3.1
Scraper, lg. flake	20	Chert, jasper	7.0	5.6	2.0	4.2	3.2	1.1
Scraper, sm. flake	14	Chert, jasper, obsidian	3.8	2.9	0.5	1.8	1.7	0.4
Scraper, end	7	Chert, jasper	5.5	4.0	1.6	2.7	1.6	1.1
Scraper, notched	4	Chert, jasper, siliceous shale	6.2	4.4	1.4	2.3	2.0	0.7
Scraper, nosed	3	Chert	6.8	4.9	2.5	4.1	3.9	1.8
Scraper, tabular	20	Chert, jasper	4.6	3.2	2.5	2.7	2.2	1.0
Scraper, sm. domed	8	Chert, chalcedony, jasper	4.1	3.4	1.5	3.4	2.3	0.8
Scraper, serrated	3	Chert	4.1	3.4	1.5	3.4	2.3	0.8
Scraper, pointed end	17	Chert, jasper	4.6	2.4	1.4	1.5	2.7	2.4
Scraper, rounded end	23	Chert, jasper	5.9	3.0	2.1	2.9	2.1	0.9
Knives	16	Chert, jasper, slate	15.6	5.4	1.0	3.4*	3.3*	1.3
Drills	12	Chert, jasper	3.6	2.1	2.1	1.6	0.7	0.6
Reamers	8	Chert, jasper	5.3	2.5	1.8	2.5	1.8	0.7
Blades	99	Chert, jasper	6.6	2.8	1.0	1.7	0.7	0.2
Flakes, retouched	284	Chert, chalcedony jasper	various sizes					
Cores	22	Chert, jasper	various sizes					

Cores, reworked	31	Chert, jasper	9.0	7.0	5.5	3.2	2.1	1.9
Cores, tabular	3	Chert	6.0	4.0	3.1	4.2	3.1	2.7
Cores, platform	5	Chert, quartzite	7.2	4.9	5.0	3.6	3.7	2.8
Unidentified	2	Slate	11.4	4.9	3.0	6.5	5.2	1.6
GROUND STONE								
Bowls	9	Sandstone, siltstone	-	-	4.6	-	-	1.1
Pestles	6	Basalt, sandstone	15.7	6.5	6.5	6.9*	5.1*	4.3*
MISCELLANEOUS								
Pitted stones	12	Sandstone	12.5	9.7	3.2	5.2	8.2	3.7
Split cobbles	3	Chert, granite	6.4	4.3	3.0	3.5	6.1	3.5
Net sinker (?)	2	Sandstone	7.0*	5.8	3.6	6.0*	6.4	4.2
Whetstone	2	Siltstone	6.1	4.5	2.6	4.3	3.3	1.6
Incised stone	1	Siltstone	9.0*	5.4	2.0	-	-	-
Cobble	1	Granite	12.0	3.8	2.5	-	-	-
Flakes, retouched	7	Quartz, jasper	3.0	2.2	1.9	1.2	2.1	1.2
Blade	1	Jasper	5.3	3.0	1.9	-	-	-
Pebble, unmodified	1	Quartz	2.8	1.7	1.1	-	-	-
Stone, unidentified	1	Sandstone	8.7	3.3	3.1	-	-	-
Pebble, tarring	2	Beach pebble	-	-	-	-	-	-
Unidentified	1	Basalt	3.8	2.0	1.9	-	-	-
Ochre		Red and yellow						
Unmodified coral	1							
Beads								
Tubular	1	Steatite	2.2	1.9	0.8	-	-	-
Circular	2	Steatite	1.1	1.1	0.4	0.8	0.8	0.3

BONE								
Awl	1	Bone	1.2*	0.6	0.4	-	-	-
Polished fragment	1	Bone	2.9*	1.2*	0.3	-	-	-
SHELL								
Beads								
Spire lopped	1	Olivella biplic.	2.0	1.3	1.1	-	-	-
Side ground	1	Olivella biplic.	2.3	1.4	1.0	-	-	-
Disc (X3b1)	3	Olivella sp.	0.5	0.5	0.1	0.2	0.2	0.1
Circular	2	Clam, Haliotis sp.	1.0	1.0	0.2	0.7	0.7	0.4
Unidentified	1	Haliotis (?)	1.1*	0.6*	0.2	-	-	-
Bead blank	2	Clam	0.9	0.9	0.4	0.8	0.8	0.1
Fishhook blank	1	Haliotis sp.	3.1	2.7	0.4	-	-	-
FOREIGN OBJECTS								
Nails	9	Metal						
Screw	1	Metal						
Staple	2	Metal						
Knife blade	1	Metal						
Dish fragments	6	Glazed white china						
Bottle fragments	3	Glass						
Fence post fragments	5	Wood						

* Denotes incomplete specimen

SLO-158

This small site is adjacent to SLO-157, being some 300 yards east. The site area is rather small and probably represents part of what at one time was a more extensive site area on both sides of Old Creek. The larger part of this site, designated as SLO-161 and located on the other side of the creek was completely destroyed except for a small knoll some 10 feet wide. Removal of brush had destroyed all but a few inches of the remaining midden. As with the previous site, the surface survey of this site produced a few artifacts, but shell and bone were comparatively rare. The midden was heavily compacted making digging difficult. Both test pits were screened by hand through quarter inch screen. Both pits were excavated to 24 inches in depth with sterile soil being encountered at about 16-18 inches.

A total of 24 artifacts were recovered both from the surface (9) and from the test pits (15). All are very similar in workmanship, materials, and type to the other collections. Test pit 1 was the more productive of the two, 10 of the 24 artifacts being recovered from this pit. It also produced a larger number of shell remains.

Faunal Remains

Both test pits were screened in their entirety through quarter inch wire mesh. All of the kinds of shell found were present in all levels of the pits with the single exception of Olivella biplicata which was not encountered below 12 inches. The following table lists the species encountered and the depths at which they were found.

SHELL SPECIES FROM SLO-158

Common Name	Scientific Name	Depth (in inches)
BIVALVES		
Pismo Clam	Tivela stultorum	0-24"
California Mussel	Mytilus californicus	0-24"
Nuttall's Saxidome	Saxidomus nuttalli	0-24"
Washington Clam	Schizothaerus nuttalli	0-24"
Rock Venus	Protothaca staminea	0-24"
UNIVALVES		
Abalone	Haliotis sp.	0-12"
Black Turban Shell	Tegula funebralis	0-24"
Purple Olive	Olivella biplicata	0-12"
Owl Limpet	Lottia gigantea	12-18"
Limpet Shell	Acmea sp.	18-24"
Thais	Thais lima	12-24"
OTHER		
Chiton	Tonicia sp.	0-24"
Barnacle	Balanus sp.	0-24"

Missing from the preceding list and found on the other sites are Land snail, Lobster, and the Platform mussel. None of these species are common in the sites in which they are found, with the possible exception of land snail found on SLO-156.

Artifact Description

Table 3 contains the totals and measurements of the artifacts recovered from the surface and from the test pits excavated on this site. Comments are in the same order as their appearance in the table.

CHIPPED STONE

Knife: A large knife fragment of red jasper was found on the surface of this site. It is well made, bifacially flaked, and has a cutting edge all around its periphery except for the area where it is broken (Plate 8b).

Scrapers: Six scrapers were recovered of two types. All are very crudely made and have been retouched by percussive methods rather than by pressure flaking.

Flake scrapers: Two flake scrapers, one a "teshoa" flake (Plate 8g) made from the side of a prepared core were found. The latter has a prepared platform and the non-bulbar side retains the cortex of the nodule from which it was struck. Both are bifacially retouched, but very erratically, the majority of the chips being removed from one side (Plate 8c, g).

Tabular scraper: Four flakes were made from a tabular piece of chert. All are unifacially worked with the flaking forming a steep angle with the relatively flat bottom. One flake has a gouge-like projection worked into it by striking off 2 relatively large chips on either side of a natural projection on the flake (Plate 8d - f).

Hammer: A large basalt cobble that has been used as a hammer was also found on the surface. It apparently has been also used as a hearth stone.

Split cobbles: Two small split cobbles were found. Neither shows any sign of having been used.

Core fragments: Seven core fragments of various sizes were saved from the test pits. The smallest of these shows some use, possibly as a scraper, a short length of cutting edge having been formed by striking off two or three flakes.

GROUND STONE

Bowls: Two fragments of stone bowls were recovered from the test pits. Both appear to have been small but heavy bowls with a rather small interior opening.

Pestle: A large fragment of a pestle with the surface formed by pecking

was found on the surface. The entire surface area is worked in this manner (Plate 9a).

Milling stone (?): A large fragment of a relatively flat piece of sandstone that has its upper surface and one side ground was also found on the surface of the sight. On the bottom, running diagonally across the corner is a deep groove that has been pecked crudely into the surface. Most of the upper surface that is preserved, is smooth and slightly concave with the exception of 2 small areas near one edge that have slight depressions ground into them (Plate 9b).

Whetstones: Two small stones that have deep diagonal V-shaped prooves worn into the face, presumably in sharpening tools on them, were also found. Both are very similar to the one shown from SLO-157 (Plate 6f).

MISCELLANEOUS

Ochre: One fragment of red ochre was found in Test Pit 2.

A single identifiable bone was encountered in the 0-12 inch level of test pit 1. This is a deer cannon bone which was unmodified.

Unidentified: A small beach pebble, ground on one end and pecked on the other, with bifacial pitted areas on the body, was also found on the surface. This specimen is very similar to those recovered on the other sites and was probably used for fine percussion flaking (Plate 8h).

Table 3 Inventory of Artifacts From 4-SLO-158

ARTIFACT TYPE	NO.	MATERIAL	MAX SIZE (in cm.)			MIN. SIZE (cm.)		
CHIPPED STONE								
Knife	1	Jasper	8.5*	5.6	1.7			
Scraper, flake	2	Chert	5.5	4.6	1.4	3.8	2.8	1.3
Scraper, tabular	4	Chert	4.1	3.3	1.5	3.9	1.7*	0.9
Hammer (?)	1	Basalt	14.1	7.7	5.9			
Split cobble	2	Basalt, Quartzite	7.2	4.5	3.8	6.8	5.1	4.1
Cores, frag.	7	Chert, Jasper	various sizes					
GROUND STONE								
Bowls	2	Sandstone	---	---	5.8	---	---	4.2
Pestle	1	Quartzite (?)	13.6*	7.2	6.3			
Milling stone (?)	1	Sandstone	15.2*	12.1*	5.0			
Whetstone	2	Sandstone	6.7	4.7	3.3	6.3	3.3	3.2

MISCELLANEOUS

Ochre	1	Red			
Unmodified	1	Deer Cannon Bone			
Unidentified	1	Basalt	7.8	3.9	1.5

* denotes incomplete specimen

SLO-159

SLO-159 is a fairly large but shallow midden located in an orchard. It is several hundred yards long and follows along the bank of Old Creek. Old Creek Road, cuts through the center of the site and a farm house is located on a portion of it. Although large in area its shallowness suggests a short occupation period.

This site was used as our campsite, and a surface collection of artifacts was made during a preliminary survey of the area. Several more were collected during the course of our stay. A small excavation for a refuse pit in the site showed the midden to be about 6 inches in depth and not worth further testing. As with the other sites, its location along the creek provided a good source of fresh water as well as a source for raw materials in the numerous cobbles and pebbles to be found in the stream bed.

A total of 33 artifacts were recovered from this site, all from the surface (the refuse pit failed to yield a single artifact). In addition 5 whole unmodified Olivella shells were collected as well as a broken human mandible.

Artifact Description

Artifact counts and measurements are given in Table 4 and comments on the collection are in the same order as they are presented in the table.

Stone Artifacts

CHIPPED STONE

Projectile point: One fragmentary blade section of a small triangular point was recovered from the surface of the site. Even though small the flaking is crude with the retouched edges being rather irregular.

Chopper: Two large nodules of chert and quartzite were classified as choppers. The largest of the two has a relatively flat bottom surface with only a few chips removed from this edge to sharpen the rougher areas. Most of the flaking is done on the opposite surface and has been classed as a unifacial scraper. The other is bifacially worked (Plate 91, m).

Hammers: Five stones used as hammers were found. Two are core fragments while the others are made from small water worn beach or stream pebbles (Plate 9 c-e).

Scrapers: Eleven scrapers of various sizes and shapes were found which have been put into two categories as follows:

Flake scrapers: Nine small flakes were recovered that were crudely flaked and were probably used as scrapers. All were bifacially flaked (Plate 9q).

Small domed scraper: Two small domed scrapers are also in the collection. Both have a small gouge-like projection worked on them (Plate 9n, p).

Knife: Two large knives, both of slate, and a smaller knife of chert were picked up for the collection. All are bifacially chipped with the smaller of the three being the most carefully worked (Plate 9f, k, o).

Cores: Four core fragments were also saved. All are of chert. One appears to have been used secondarily as an end scraper (?).

GROUND STONE

Bowl: One large fragment of a small heavy bowl was found. A small portion of the rim is preserved on the fragment. This is rounded, thinner than the heavier body of the bowl, and is undecorated. The rim is 1.5 cm. thick while the body is at least 4.5 cm. thick.

Pestle: Two small fragments of pestles were found. The material is almost identical and they could be fragments of one pestle. If so, an indeterminate part of the central section of the pestle is missing. Both fragments exhibit battering on the ends (Plate 9g, h).

Whetstone (?): Two small tabular pieces of sandstone appear to have a portion of their surface area utilized as a grinding surface (Plate 9i, j).

Unidentified: Two small flat basaltic beach or stream pebbles that closely resemble those found on SLO-156 and 158 were recovered from this site. Both have a ground edge and the opposite edge is pecked. They were probably used as light hammers for fine percussion chipping (Plate 8h, j).

SHELL

Unmodified: Five whole, unmodified Olivella biplicata shells were found scattered on the surface. These were the only whole shells noted although a few scattered fragments of Pismo clam were also seen.

Also found on the surface of the campsite was a broken human mandible. This still had the first and second molars as well as the two pre-molars of the left side still in place. No other evidence of burials was noted.

Table 4 Inventory of Artifacts From 4-SLO-159

ARTIFACT TYPE	NO.	MATERIAL	MAX. SIZE (cm.)			MIN. SIZE (cm.)		
CHIPPED STONE			L	W	H	L	W	H
Projectile point	1	Chert	1.7*	1.6	0.3			
Chopper	2	Chert, quartzite	10.3	7.6	5.3	7.7	5.6	3.1
Hammers	5	Basalt, sandstone Chert	11.6	7.8	3.3	6.9	6.3	4.6
Scrapers, flake	9	Chert	5.9	5.2	2.0	3.2	1.8	0.8
Scrapers, sm. domed	2	Chert	4.7	3.5	3.2	3.5	2.0	2.2
Knives	3	Slate, chert	9.8	4.8	2.1	4.6	2.4	1.4
Cores	4	Chert	various sizes					
GROUND STONE								
Bowl	1	Sandstone	---	---	4.2			
Pestle	2	Granite	6.4*	5.5	4.0	5.8*	6.0	4.5
Whetstone (?)	2	Sandstone	7.6*	6.5	2.8	7.2*	5.8	3.8
Unidentified	2	Basalt	7.7	3.6	1.3	6.3	3.4	1.9
SHELL								
Unmodified	5	Olivella biplicata						

* denotes incomplete specimen

SLO-160

SLO-160 is located on a narrow terrace which overlooks Old Creek and is about three-quarters of a mile north of SLO-157 (see Fig. 1). The terrace is about 20 feet above the stream bed and is relatively level. At this point the canyon is very narrow, and permits the location of any habitation site only on this terrace. The creek impinges on a steep oak covered knoll on the opposite side. This knoll rises directly from the creek bed to a height of some 750 feet. About a half mile south of this point the valley broadens out on both sides of the creek with level terraces on both sides, one of which contained an orchard within which SLO-157 is located.

Three test pits were dug into this site, all of which failed to produce a single artifact of non-European manufacture. The only possible aboriginal implement found was a small core fragment which appears to have a small chipped area indicating use as a scraper. This was found on the surface in the preliminary survey of the site. A few scattered shells were also noted at this time but none were recovered in any of the test pits. This site, recorded in the original survey completed in March of 1960 (Riddell, 1960:1), had been heavily bulldozed during the removal of brush from the surface of the site prior to our arrival. This operation probably destroyed the comparatively shallow midden since it is not uncommon to remove up to 12 inches of topsoil with the brush.

Artifact Description

In the test pits were recovered 35 nails of various types, a portion of a door locking mechanism, and 23 fragments of glass, 2 fragments of which were bottle glass, the rest being shattered pane glass. Also found was a small blue glass bead, 1.3 x 0.3 x 0.3 cm. This has a rough, pebbly surface and has remained unidentified. It appears to be of rather recent manufacture (it bears traces of a casting edge as if made in a mold) and probably represents a recent deposition on the site (a farmhouse is located on the edge of the site). It is not listed in Meighan's trade bead typology or is it known to him personally (Meighan, personal communication).

This area was the location of an old schoolhouse in the canyon (Central Schoolhouse) which has been torn down, and the objects found probably represent refuse from this building.

SUMMARY AND CONCLUSIONS

From the foregoing site and artifact descriptions it is apparent that with the possible exception of the stemmed projectile points, diagnostic artifacts are lacking in the collections. Almost all that were recovered, are crude and enjoy a wide distribution in both time and space. Seriation of the sites on the basis of differences in tool types or using the assemblage as a totality is also impossible, since the material on all the sites is similar in form and workmanship, and a comparison emphasizes this uniformity.

The points are of types that are related to the earlier strata in California archaeology. They are found in Rogers' Hunting Culture (Rogers, 1929: Plate 59); Carter notes them at Point Sal where they are found in Stratum II and become predominant in Stratum III (Carter, 1941). Hewes also notes them in his survey of the Central San Joaquin Valley, at his Ccalinga-Avenal sites (Hewes, 1941:129). These two areas may represent an intrusion into this region, for he notes that they differ from the rest of the regions and relates them to the Chumash area. Wallace also found in his survey of the Arroyo Grande area that stemmed types predominated over other forms (Wallace, 1959: 14). This type of point is also found in the area of Vaquero Reservoir on a disturbed site recently excavated (Wire, 1961). These types are also found in the earlier horizons of the Central and Sacramento Valleys. Of these Type 1 points, only 1 whole specimen is less than 5.0 grams, while 3 basal fragments are also less than 5.0 grams. These, however, would weigh well

over this if complete. Large size and weight are generally attributed to the earlier point forms and these fulfill these requirements as well as being of a shape that is widespread in earlier collections. Their use at Whale Rock is indicative of the persistence of this earlier cultural level in a comparatively isolated region. The early Spanish regarded this northern Chumash area as only a reflection of the higher development attained in the Santa Barbara region (Kroeber, 1925:551). Our excavations bear this out in that the cultural affiliations suggest relationships with the south rather than with the more northern tribes, and the artifact types appear to be related to earlier forms while the dating is apparently well within the later Canalino periods.

Preservation of the material remains is also an important factor in this analysis. Excavation provided, with too few exceptions, almost no clue to the extent of the use of bone or shell. Even the ecological remains are scant. Stone artifacts outweigh all others. Poor preservation of bone and shell and the destruction and disturbance of the later cultural levels make it difficult to make assumptions about the material culture that existed. Sites destroyed by heavy equipment during the dam construction indicated that some of them were more developed materially than others; at least they apparently had a greater abundance of material goods preserved in them and of finer workmanship. Grave offerings, according to workers' accounts, consisted in many cases of well worked sandstone bowls, often with shell inlay work in asphaltum, quantities of beads of various types, and well made pestles. In a few instances these accounts were verified in part by the author viewing the artifacts in question. Unfortunately none of these sites were investigated at the time of their destruction, and most of our knowledge of them comes from the collections made by the workmen. Many of the skeletal remains were collected and saved by the workers, but all were so badly broken that little information could be gleaned from them. Especially important and lost was data pertaining to depth, site, orientation of the burials, artifacts associated, etc. Sites destroyed in this manner (by the use of a dragline), and apparently with a more typical Chumash burial pattern, include SLO-161, 162, and 163. Excavations on the sole remaining midden (SLO-154) may provide answers to some of the questions that remain unasnwered by our work.

It is also difficult to assess the culture in terms of its subsistence focus for these same reasons; poor preservation and widespread destruction. Faunal remains at all the sites are scarce, with animal bone being practically absent. This would seem to indicate that hunting was only a subsidiary occupation or at least only one of a number of subsistence activities. The relatively few projectile points add weight to this argument. Shell fish remains indicate that the gathering of molluscs was part of the pattern, while the almost total absence of fish bones can only be interpreted as indicative of their unimportance in the diet. Mortars and pestles as well as the use of bedrock mortars on several of the sites attest to the importance of vegetable foods. In short, there appears a picture of groups that were relatively omniverous and apparently all of the available food resources were exploited with no one of them contributing the major part of the diet.

The middens of the sites were uniform throughout--SLO-156 being the sole exception--and gradually shaded off into sterile adobe. No indications of

structural remains were found in any of the pits excavated nor were any noted as surface features. Also lacking were any clearly defined fire areas although the large number of thermally cracked stones both on the surface and in the pits were evidently the result of their use as hearths or their being heated for other purposes. Most were scattered promiscuously through the sites and only in 4 instances were they noted features. In all instances however, no ash or charcoal was found in association with them. Scattered charcoal occurred in the middens, but not in abundance.

Burials, at least in the case of the 4 recovered on SLO-157, were notably lacking in grave offerings, expecially in view of the limited evidence that some of the sites contained relatively rich burial goods. This may be due to the fact that the burials found were limited to children. Whether or not this is significant is also an open question. Cremations may also be a part of the burial practices, but evidence for this is limited to a single piece of partially burned mandible. The burials are evidently of a later period in time than the date for the basal layers in which they were found for all 3 of the deeper burials had penetrated sterile subsoil which seems to indicate that the burial pits had been dug through at least the greater part of the midden deposit. This is reinforced by the fact that in view of the poor preservation of bone and shell in the midden, especially in the lower levels, the bones of the human burials, though badly cracked and broken, were well preserved and indicate a later deposition.

The remaining artifacts represent a generalized collection of tools that could be duplicated at any number of sites. With the possible exception of the projectile points which have already been discussed, they can not be definitely correlated with any specific or limited time period nor with any particular area.

DATING OF THE SITES

Dating of the area still presents some problems in spite of a Carbon date for SLO-157. It is difficult to imagine that the valley could support 16 sites contemporaneously, and as a consequence it must be inferred that at most two or three enjoyed the valley at any one time. Another factor that tends to bear out this conclusion is the probable uniformity of the resources available. This uniformity, coupled with the variety of food resources available, probably resulted in the sites being continuously occupied once established. Specific areas where some particular source of food was exploited or an especially favored stone quarry occurred and were seasonally occupied, probably did not exist. Some exception to this general statement may be found at the sites with bedrock mortars, for only a few of the sites in this alluvial valley floor have sufficiently large rocks which could be utilized in this manner. Three sites had these bedrock mortars (Riddell, 1960:4); however portable mortars were found in most of the others. Thus we have 16 sites that were continuously occupied rather than seasonally occupied in less than one and one-half miles. That not all of them were of equal importance is indicated by the range in size and midden depth; however, at least 3 were of village size (SLO-154, 157, and 163). Probably some of the others destroyed in construction of the dam approached these in size as well. In view of this, it appears that a long period of occupation occurred in this valley and the single date represents only some point on a continuum of unknown length.

This one point is established by the C-14 date of 340 A.D. + 80 years from SLO-157. Another might be established by the fact that SLO-154 was probably unoccupied by about 1750 A.D. Several early explorers passed this way and this large site occupied an area in clear view of their passage at the mouth of the valley. That no villages are mentioned in this region in these accounts and that meetings with Indians are mentioned for areas both to the North and South but not in the Estero Bay region, leads to the conclusion that none of the sites in the valley were occupied. SLO-154, if occupied, would have been noted, and if the sites out of sight in the valley had been inhabited it would seem that chance alone would have made some contact likely. In view of the comparatively peaceful relationships that existed between the Indians and the early travelers of this coast, it is unlikely that fear would have made them avoid each other. Also, utilization of the resources of the sea and the necessity for travel to and fro help increase the likelihood of contact occuring on at least one of these trips if the sites had been occupied. That they did not occur must be assumed from the accounts and if these assumptions can be accepted, we then have two points on our continuum, 340 A.D. and 1750 A.D., a span of some 1400 years. This latter date probably represents one end of the continuum as well.

It seems unlikely that this span of 1400 years represents the total time that the valley was occupied. If we can assume that no more than 2 or 3 sites existed at any one time, then 1400 years would seem to be too short a period to allow for 5 to 7 successive occupations, even if we assume that they succeeded one another with no time lapse. Therefore I feel it reasonable to assume that SLO-157 does not represent the earliest occupation, but was probably preceded in time by others.

SLO-156 may represent the earliest occupation of the valley. Several arguments can be marshalled in its favor. In view of the uniformity of resources, the confluence of the two streams would seem to be a highly desirable site. The depth of the midden indicates a rather long occupation, and the calcerous condition of the artifacts and scraps of bone recovered from the lower midden may be indicative of age as well. If the lower midden is the result of occupational deposition rather than redeposition of materials, then the site was first established on what was at that time the shallow banks of the creek. Its favorability as a location probably outweighed the danger from periodic inundation by the overflowing of the creeks. Eventually the site was abandoned, probably because of the periodic rising and overflowing of the streams. Several layers of sterile sand and gravels were laid down during this time and then the site was reoccupied. The length of time between this abandonment and reoccupation is not known. It may have been abandoned prior to any serious problem with the flooding of the site, since the break in the soil profile may indicate that the surface had been partially eroded prior to the deposition of these sterile layers. The problem becomes one of how much time had elapsed between the abandonment of the lower midden and the reestablishment of occupation on the site.

None of the other middens excavated showed the presence of these sand and gravel layers. It is entirely possible that the abandonment of SLO-156 forced the reestablishment of the sites on higher ground to avoid the dangers of periodic floods. If so, then the site would only have been reoccupied after sufficient deposition had occurred to insure its being above the flood line.

At present these speculations cannot provide us with the answer to the problem; however, the possibility of eventually dating some of the materials available from both the upper and lower middens of this site will give us a much firmer base for establishing these occupations in a proper perspective both to each other and to the other sites for which we have obtained data. Until such time, the date from the basal layers of SLO-157 indicates something of the time depth involved in the occupation of this valley.

APPENDIX 1

Bone Identification From Whale Rock Reservoir

by

Ed Mitchell
Los Angeles County Museum

SLO-156	DEPTH (in inches)	PIT NOS.
Odocoileus hemionus (deer)	66-78, 84-96	F-21, F-27
SLO-157		
Odocoileus hemionus (deer)	0-36	D-7, I-8, M-4 N-4, X-4
Arctocephalus sp. (fur seal)	12-18	D-7
Enhydra lutris (sea otter)	18-24	K-6
Carnivore (sp.?)	12-18	D-7
Mammal (sp.?)	12-24, 30-42	J-5, H-9, K-6 L-5
Rodent (sp.?)	36-42	K-6
Fish (sp.?)	12-18, 30-36	K-6, L-5
Homo sapiens	12-24	K-5, K-6, L-5
SLO-158		
Odocoileus hemionus (deer)	0-12	TP #1
Mammal (sp.?)	0-12	TP #1
Fish (sp.?)	0-12	TP #1

BIBLIOGRAPHY

Bonnet, Paul
1940 The Edible Bivalves of California. California Fish and Game, vol. 26, no. 3, San Francisco.

Carter, G. G.
1941 Archaeological Notes on a Midden on Point Sal. American Antiquity, vol. 6, no. 3, Menasha.

Gifford, E.W.
1947 Californian Shell Artifacts. Univ. of Calif. Anthropological Records, vol. 9, no. 1, Berkeley.

Gifford, E.W. and W.E. Schenck
1926 Archaeology of the Southern San Joaquin Valley, California. Univ. of Calif. Publications in Amer. Archaeology and Ethnology, vol. 23, no. 1, Berkeley.

Hewes, Gordon W.
1941 Reconnaissance of the Central San Joaquin Valley. American Antiquity, vol. 7, no. 2, pt. 1, Menasha.

Hooton, Ernest A.
1946 Up From the Ape. (rev. ed.), The MacMillan Co., New York.

Kowta, M.
Unpublished Manuscript on Stone Tools From Goleta, California.

Kroeber, Alfred L.
1925 Handbook of the California Indians. BAE Bulletin 78, Smithsonian Institute, Washington, D. C.

McKusick, M.B.
Unpublished Field Notes From Whale Rock Reservoir.

McKusick, M.B. and Dick Watson
1959 Grinding Implements From Vaquero Reservoir. Archaeological Survey Annual Report, 1958-1959, Los Angeles.

Meighan, C.W.
1959 The Little Harbor Site. American Antiquity, vol. 24, no. 4, Salt Lake City.

Olson, R.L.
1930 Chumash Prehistory. Univ. of Calif. Publications in Amer. Archaeology and Ethnology, vol. 28, no. 1, Berkeley.

Priestly, H.I.
1937 A Historical, Political, and Natural Description of California by Pedro Fages, Soldier of Spain. Univ. of Calif. Press, Berkeley.

Riddell, Francis
1951 The Archaeology of Site Ker-74. Univ. of Calif. Archaeological Survey Report No. 10, Berkeley.

Riddell, Francis
1960 Archaeological Reconnaissance of Whale Rock Dam and Reservoir. Dept. of Water Resources Archaeological Report No. A-2, Sacramento.

Reinman, F.R. and S. Townsend
1960 Six Burial Sites on San Nicolas Island. Archaeological Survey Annual Report, 1959-1960, Los Angeles.

Rogers, David B.
1929 Prehistoric Man of the Santa Barbara Coast. Santa Barbara Museum, Santa Barbara.

Swartz, B.K. Jr.
1959 Microblade Manufacture in the Santa Barbara Channel Region. (Appendix 3 to Introduction to Anacapa Island Archaeology by M.B. McKusick), Archaeological Survey Annual Report, 1958-1959, Los Angeles.

1960 Balde Manufacture in Southern California. American Antiquity, vol. 25, no. 3, Salt Lake City.

Wallace, W.J. and E.S. Taylor
n.d. Unpublished Report on Archaeological Investigations in the Arroyo Grande Creek Watershed.

Wire, M.V.V.
n.d. Manuscript on Excavations at Vaquero Reservoir.

EXPLANATION OF FIGURES AND PLATES

Figure 1. Map of Estero Bay and Cayucos showing the site locations within the Reservoir area.

Figure 2. Soil profiles of pits F-20 and F-21.

Figure 3. Map of SLO-156 showing pits excavated.

Figure 4. Map of SLO-157 showing excavations.

Plate 1. General view of site area at Whale Rock Reservoir. a, view of valley looking east from SLO-157. Note heavy growth of thistle which is a characteristic feature of all the sites noted in this area; b, view of site area from access road to the east of the sites. Shows extent of destruction of the sites. SLO-151, 153 were located in the foreground, while SLO-163 has been destroyed just on the other side of the bridge.

Plate 2. SLO-156. a, view looking south from SLO-157; Remains of SLO-156 are on the right center of the picture. More than half the site has been removed and once extended nearly to the left margin of the picture; b, view of cut bank left after removal of the site. Double midden in plainly visible in the photo. Rod in center of photo is a 12 foot stadia rod; c, pits F-20 and F-21 at completion of excavations at the 10 foot level. R. Harshbarger in pit; d, stone feature encountered at the 90 inch level. This feature contained a fragment of a badly decomposed sandstone bowl.

Plate 3. SLO-157. a, general view of site showing removal of thistle before excavations began. Arrow points to location of Burial 1 recovered in preliminary survey; b, view looking west showing large trench excavated by bulldozer on back edge of site. Dark line on hill in the left background indicates level the water will attain when dam is full; c, burial 2 showing condition of burial and pestle in possible association; d, pit K-6 showing rock cairn partially removed to expose burial 4; e, burial 4. Note stone chip between teeth.

Plate 4. SLO-156. Stone artifacts. a-c, knives; d,e, used flakes; f, reamer; g, drill fragment; h, serrated scraper; i, small domed scraper; j, l-o, cores; k, retouched blade; length of a, 8.7 cm., b-o to scale; p, bowl fragment; q, pestle fragment (?); r, split cobble hammer; s, chopper; t, hammer; length of s, 19.0 cm., p-t to scale.

Plate 5. SLO-157. Chipped stone artifacts. a-i, type 1 points; j, type 2 point; k-t, point fragments, unidentified; u-x, knives; y-bb, pointed scrapers; cc-ff, rounded scrapers; gg, hh, slate knives; ii-kk, drills; ll-oo, reamers; pp-rr, tabular scrapers with a gouge-like point; ss-b', blades; length of a, 21.5 cm., others to scale.

Plate 6. SLO-157. Beads and Miscellaneous; Chipped Stone Tools. a, incised stone; b, unidentified pebble with ends ground (?); c, stone bead, biconical perforation; d, tubular bead of steatite; e, circular beads of steatite; f, whetstone; g, fishhook blank; h, i, bead blanks; j, disc beads of Olivella; k, side ground bead; l, spire lopped bead; m, fragment of a

Haliotis (?) bead; length of a, 9.0 cm., b-m to scale. n-q, scraper/choppers; r, unidentified slate tool (wedge?); s, knife; t,u, small domed scraper; v, nosed scraper; w-y, large flake scrapers; z, serrated scraper; aa, bb, end scrapers; cc, tabular core; dd, ee, platform cores; ff-ii, notched scrapers; jj, small chip with diagonal pressure flaking on one surface; kk, blade with notched end; length of 4, 11.4 cm, n-kk to scale.

Plate 7. SLO-157. Ground stone artifacts. a-c, pestles; d,l, choppers; e,f, hammers; g, fragment of large sandstone bowl with square rim; h-k, pitted stones; m, net sinker fragment (?); n, large hammer; length of a, 15.7 cm., others to scale.

Plate 8. SLO-156. Bone object. a, whale vertabra with 9 holes drilled in one end; length of specimen, 20.5 cm. SLO-158, Stone artifacts. b, knife made of jasper; c, flake scraper; d-f, tabular scrapers, d with gouge-like projection; g, "teshoa" flake scraper; h-k, unidentified objects from SLO-156, 158 and 159, probably pecking stones. Edge toward top of photo is ground edge; length of b, 8.5 cm., c-k to scale.

Plate 9. SLO-158. Ground stone objects. a, pestle fragment; b, milling-stone fragment. Note several surfaces that are ground; length of a, 13.6 cm., be to same scale. SLO-159, Surface collection of stone artifacts. c-e, hammers; f, slate knife; g,h, pestle fragments; i,j, whetstones (?); k, slate knife; l,m, choppers; n,p, small domed scrapers; o, small knife; q, flake scraper; length of f, 9.8 cm., c-q to same scale.

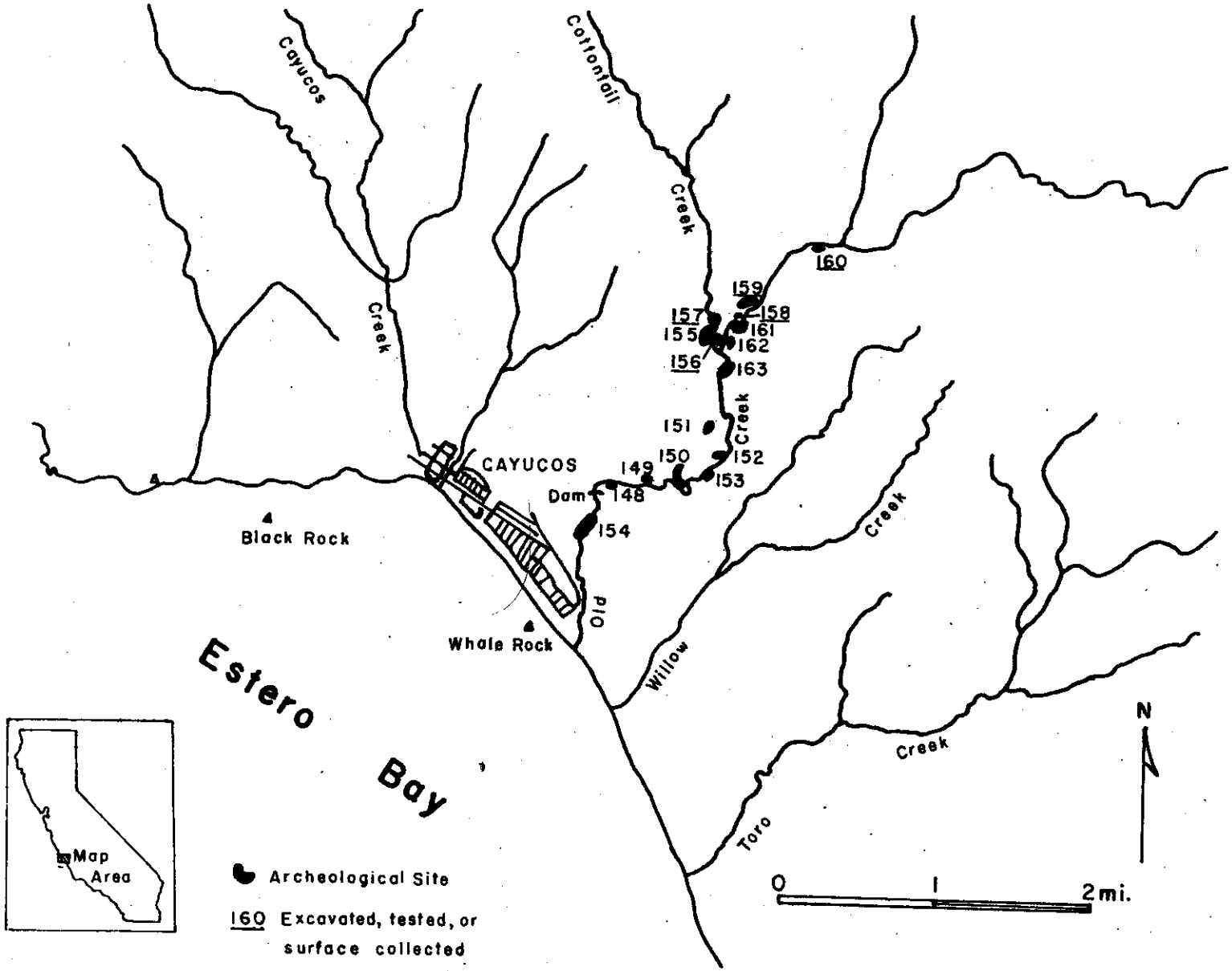


FIG. 1. MAP OF ESTERO BAY AND CAYUCOS, CALIFORNIA

Legend, Figure 2:

A Dark upper midden containing shells, tools, and scattered charcoal.

B Mixed zone of clay and gravel.

C Coarse sand and gravel.

C_1 Fine sand and gravel.

C_2 Medium sand and gravel.

C_3 Very fine sand and gravel.

D Light tan clay impregnated with lime (lower section of lower midden).

E Tan sandy clay (upper section of lower midden).

F Dark clayey sand.

G Dark sandy clay.

Layers D and E, which comprise the lower midden, should be thought of as a unit and are differentiated solely on the basis of the presence or absence of lime impregnation.

FIG. 2

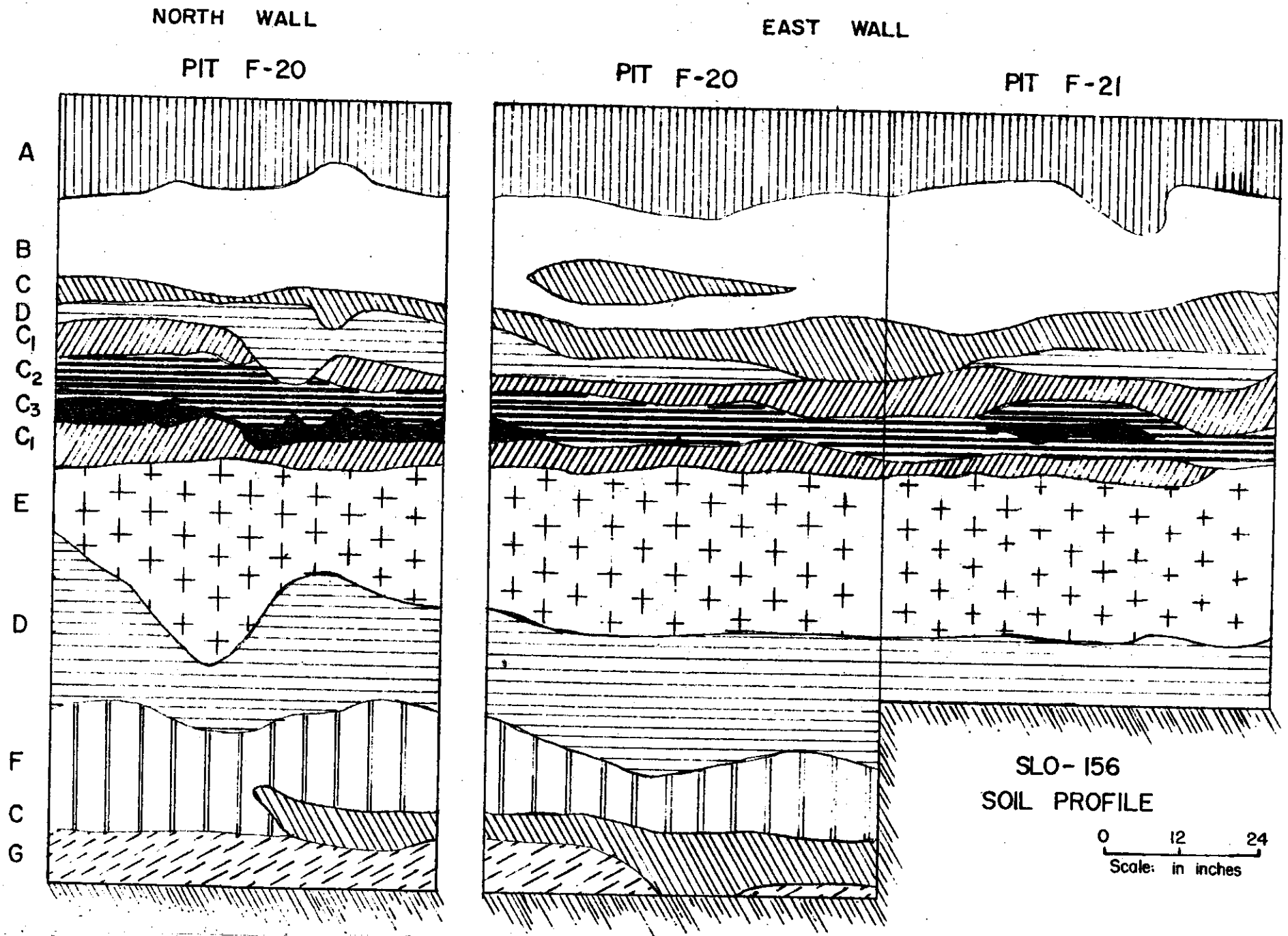
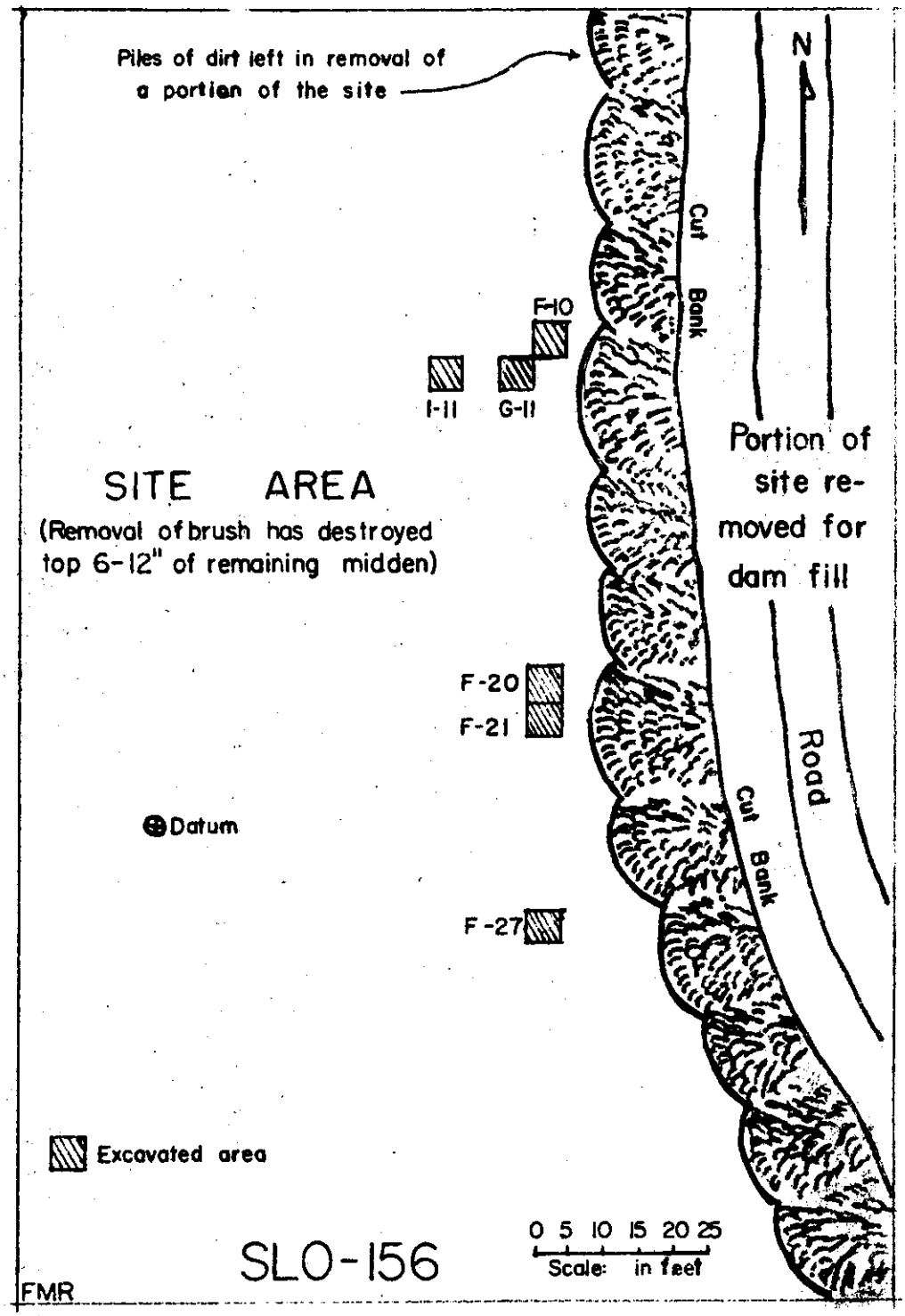
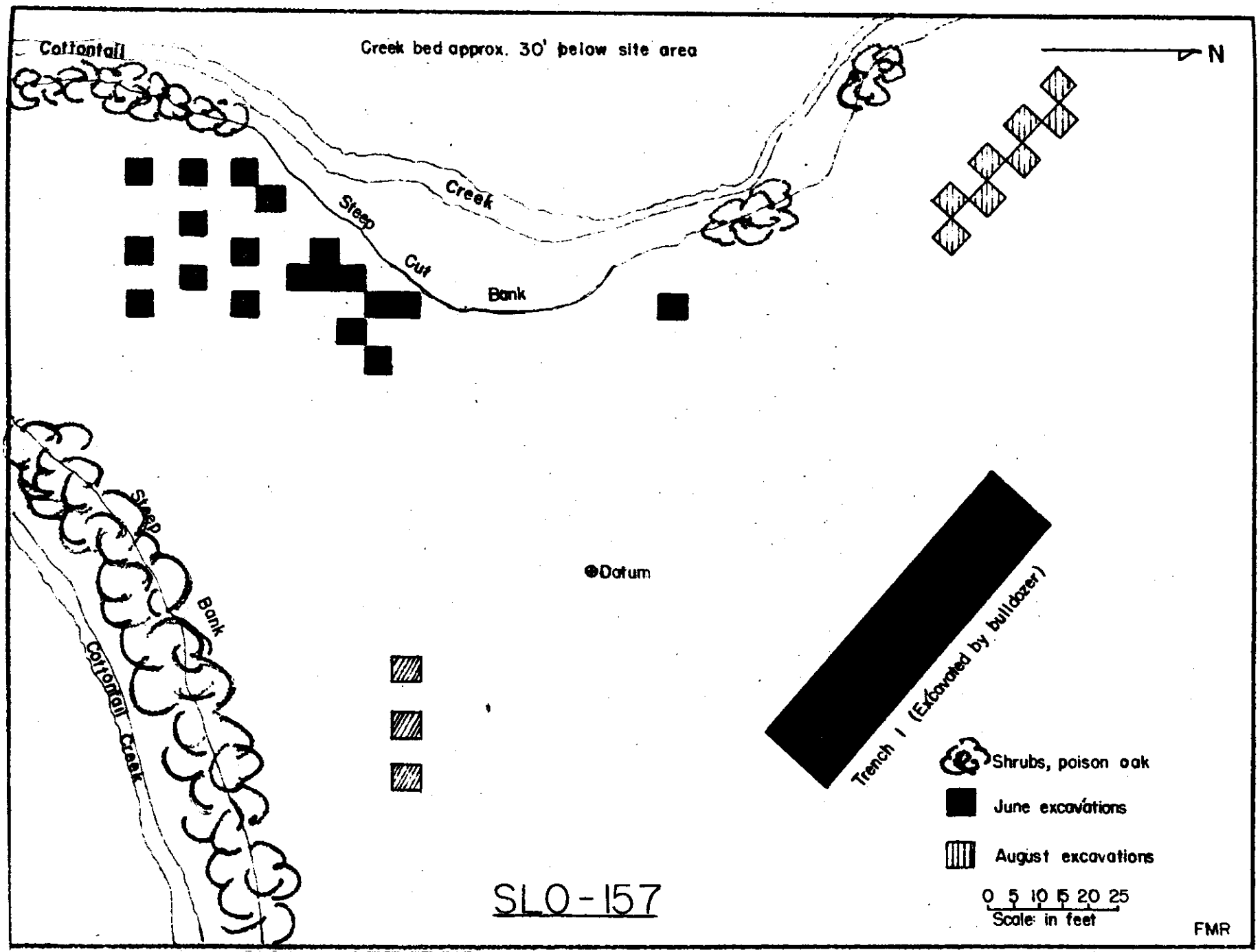

NORTH WALL
PIT F-20
EAST WALL
PIT F-20
PIT F-21
A
B
C
D
C1
C2
C3
C1
E
D
F
C
G
SLO-156
SOIL PROFILE
0
12
24
Scale: in inches

FIG. 3

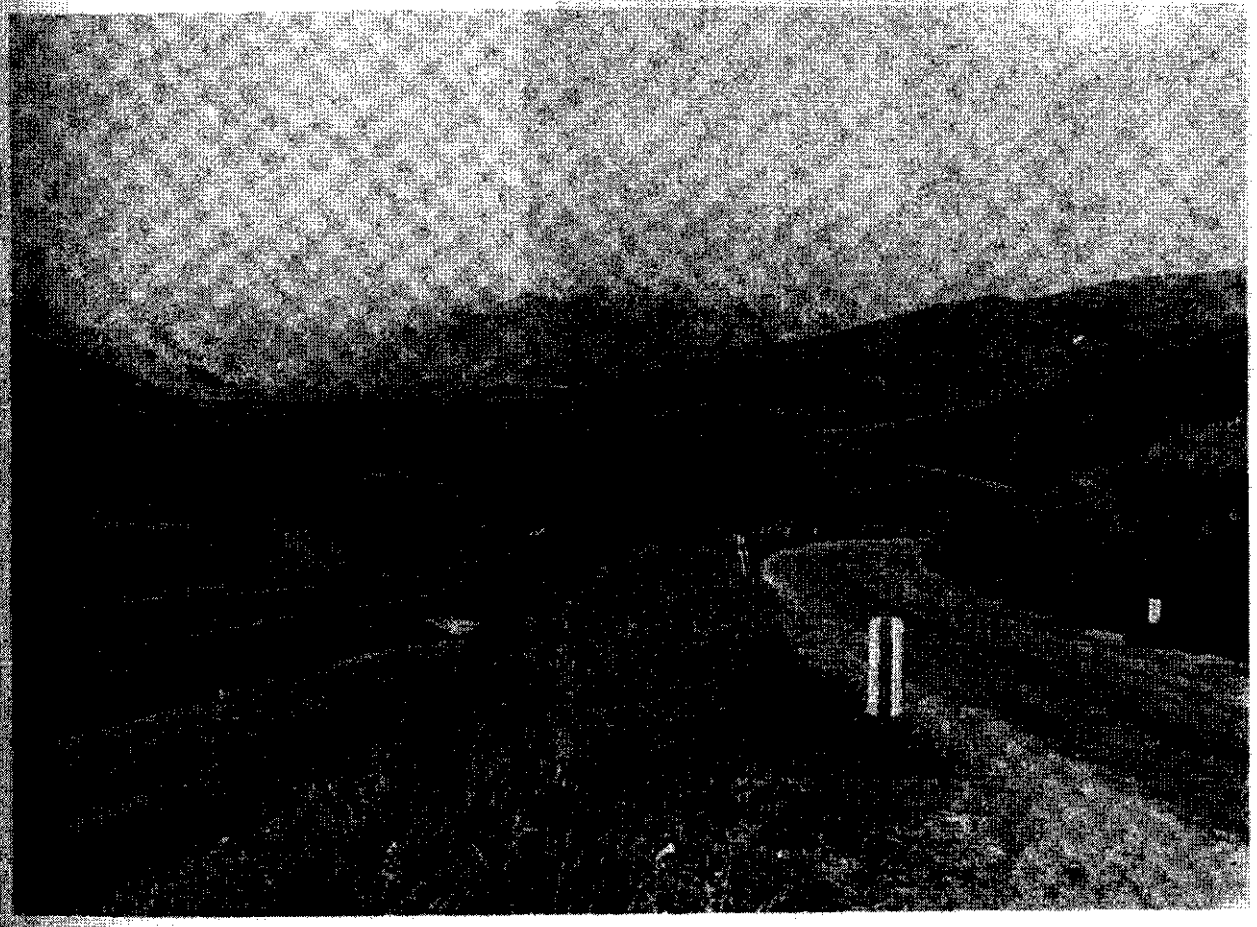

Piles of dirt left in removal of a portion of the site
N
Cut Bank
F-10
I-11
G-11
SITE AREA
(Removal of brush has destroyed top 6-12" of remaining midden)
Portion of site removed for dam fill
F-20
F-21
Road
Datum
Cut Bank
F-27
Excavated area
0 5 10 15 20 25
Scale: in feet
SLO-156
FMR


Cottontail
Creek bed approx. 30' below site area
N
Steep
Creek
Cut
Bank
Steep
Bank
Cottontail Creek
Datum
Trench 1 (Excavated by bulldozer)
Shrubs, poison oak
June excavations
August excavations
0 5 10 15 20 25
Scale: in feet
FMR

SLO-157

PLATE I

A

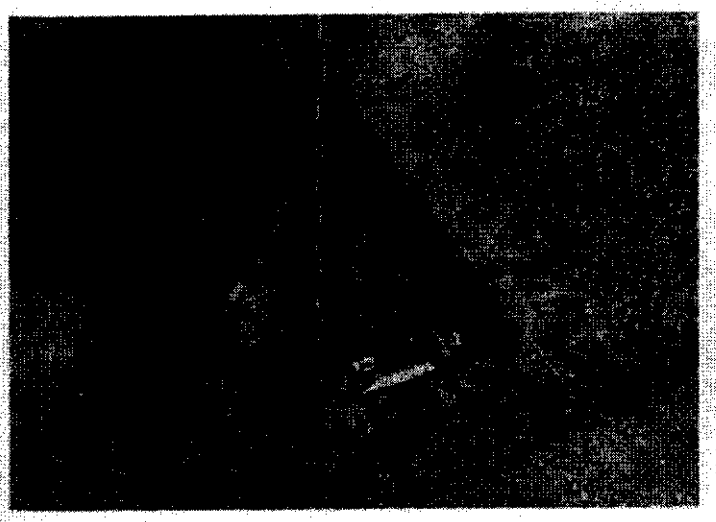


B

PLATE 2

A

B



C

D

PLATE 3

A

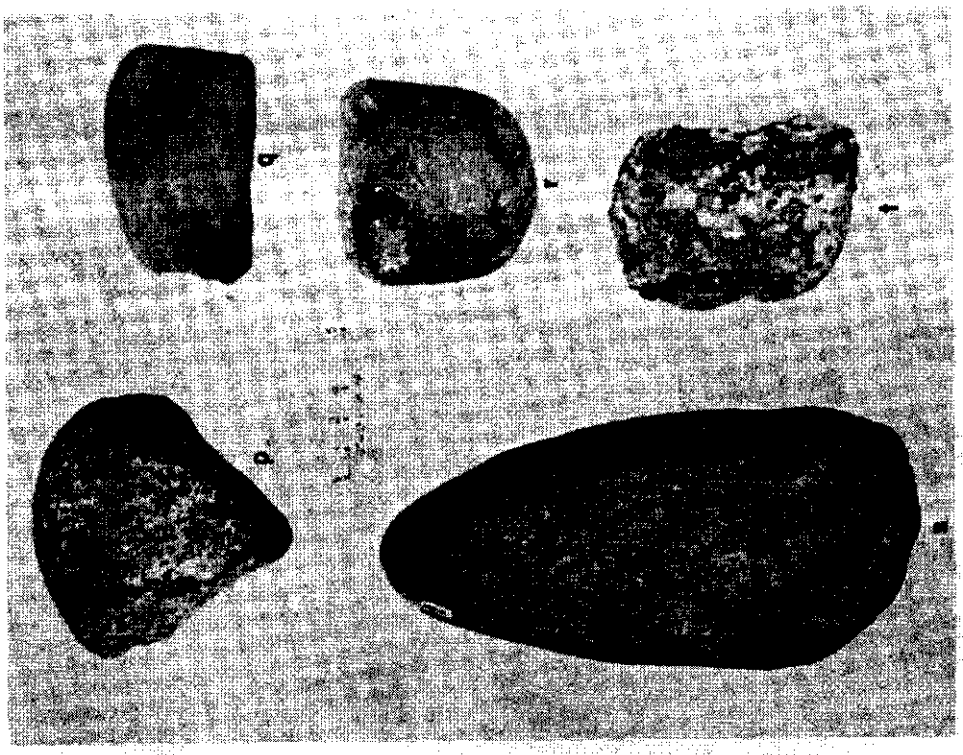
B

C

D

E

PLATE 4



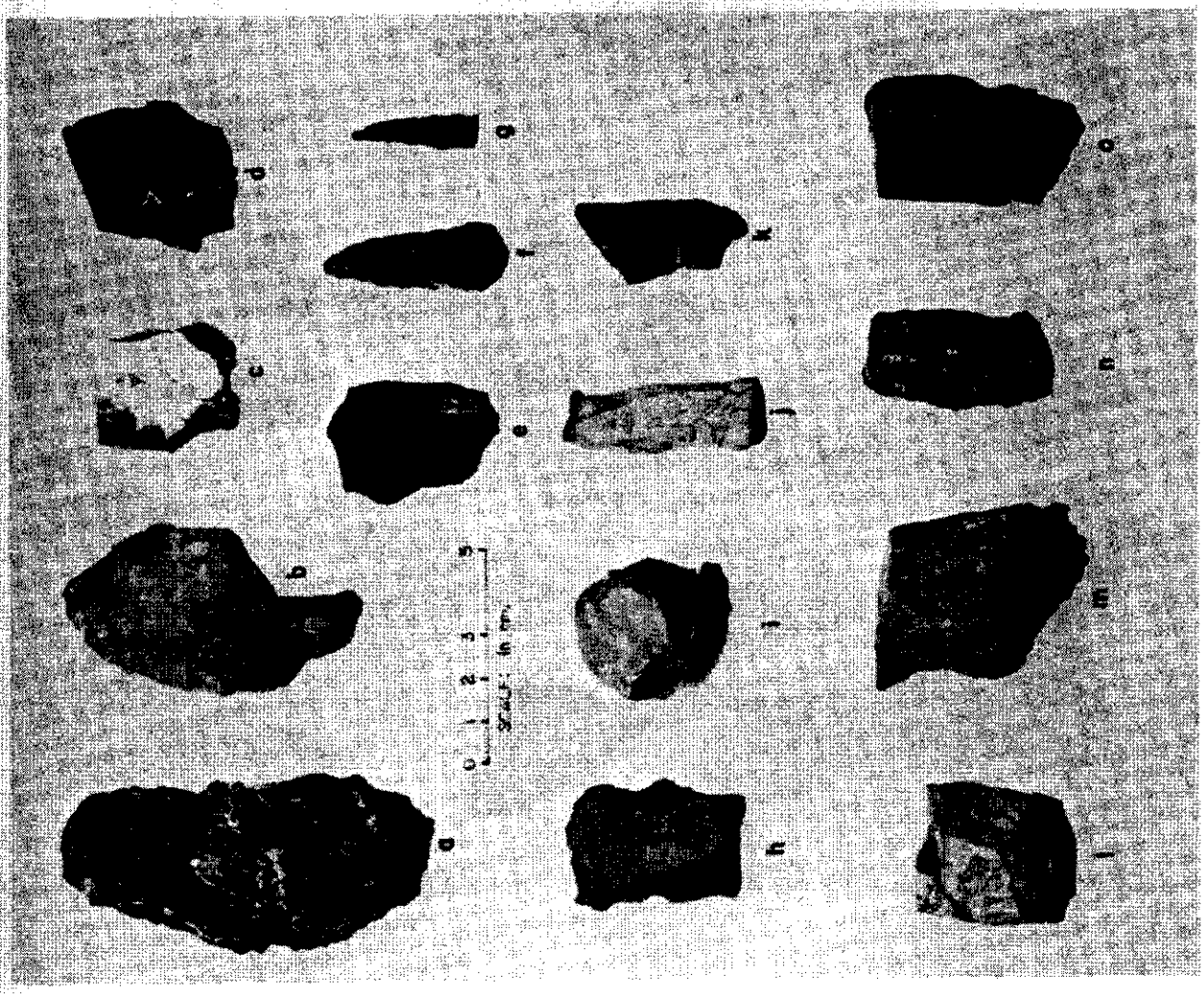


PLATE 5

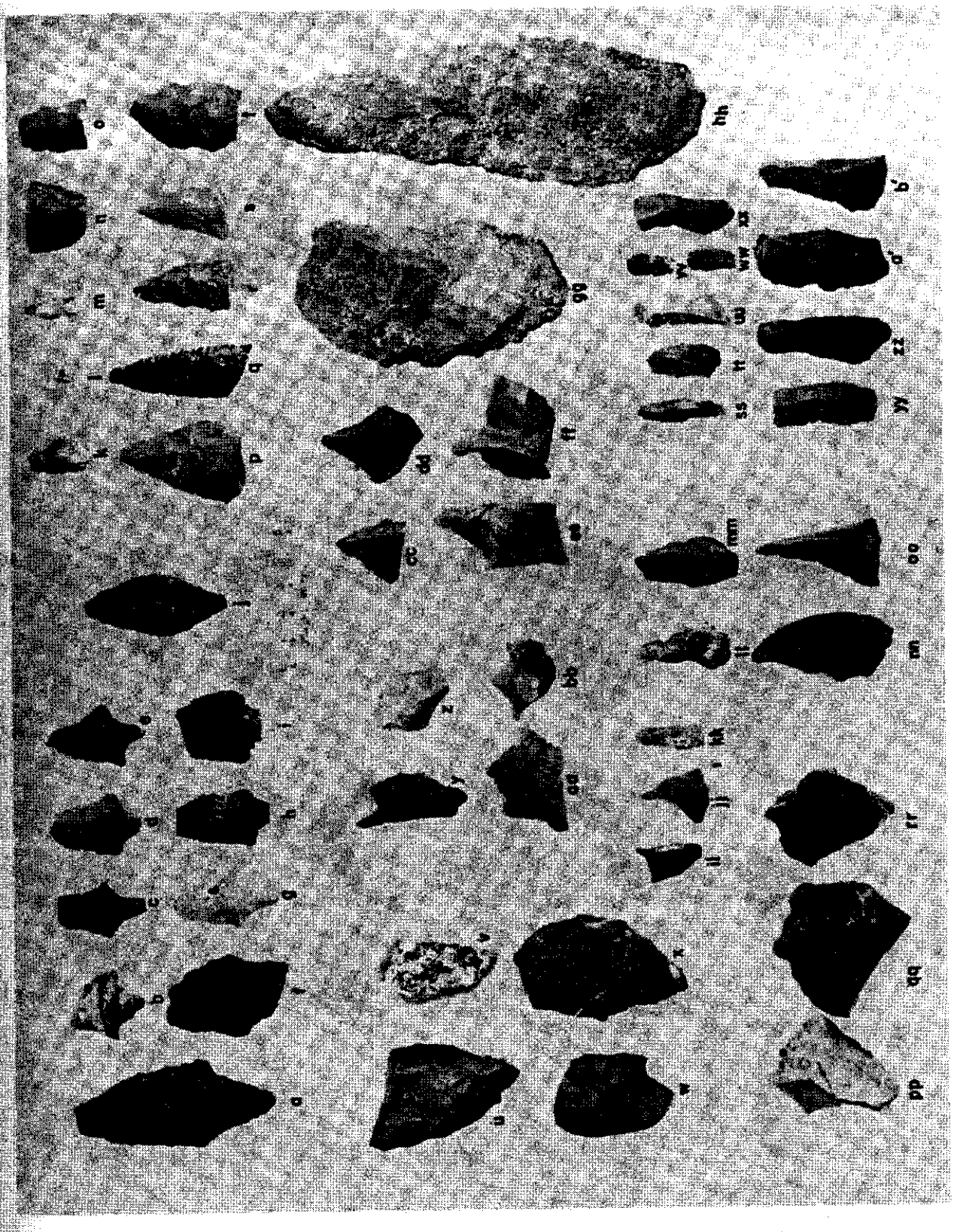
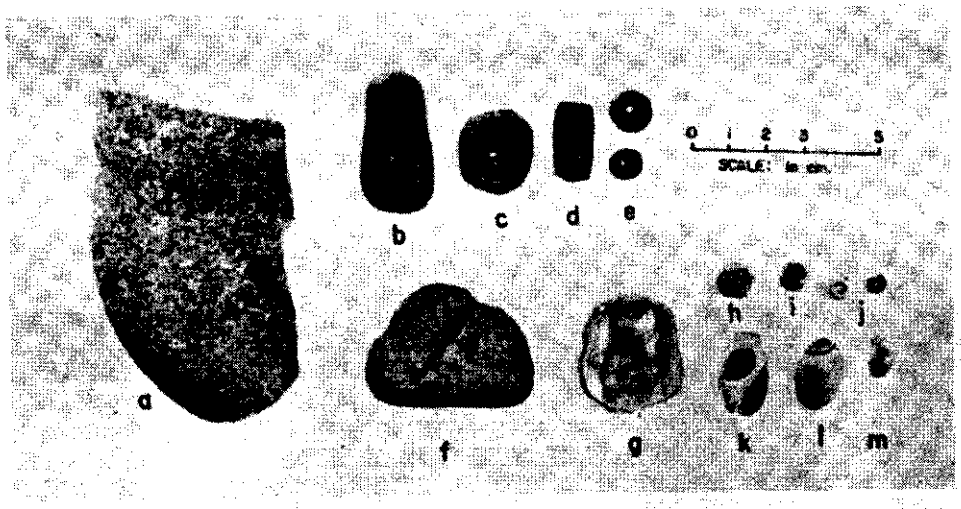


PLATE 6


a
b
c
d
e
f
g
h
i
j
k
l
m
0 1 2 3 5
SCALE:

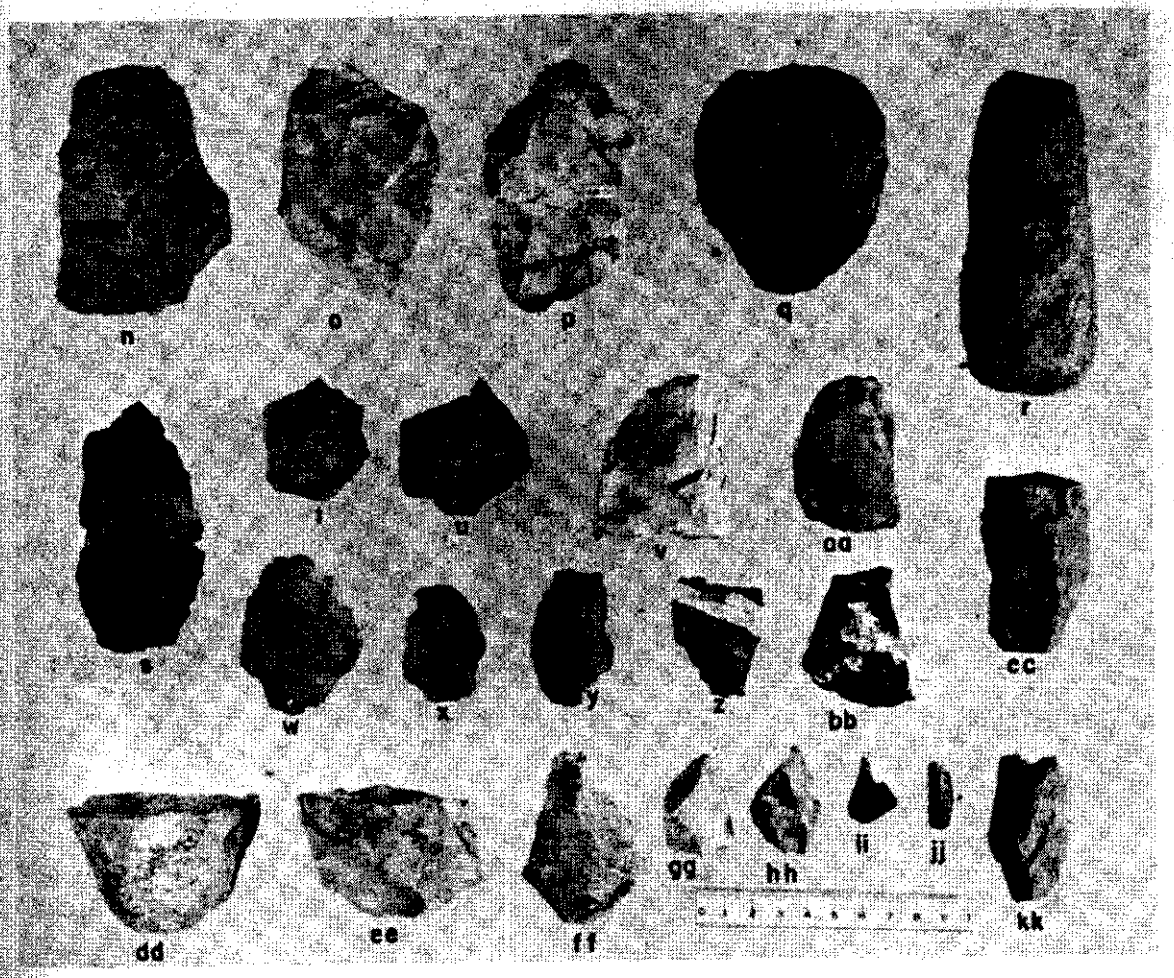
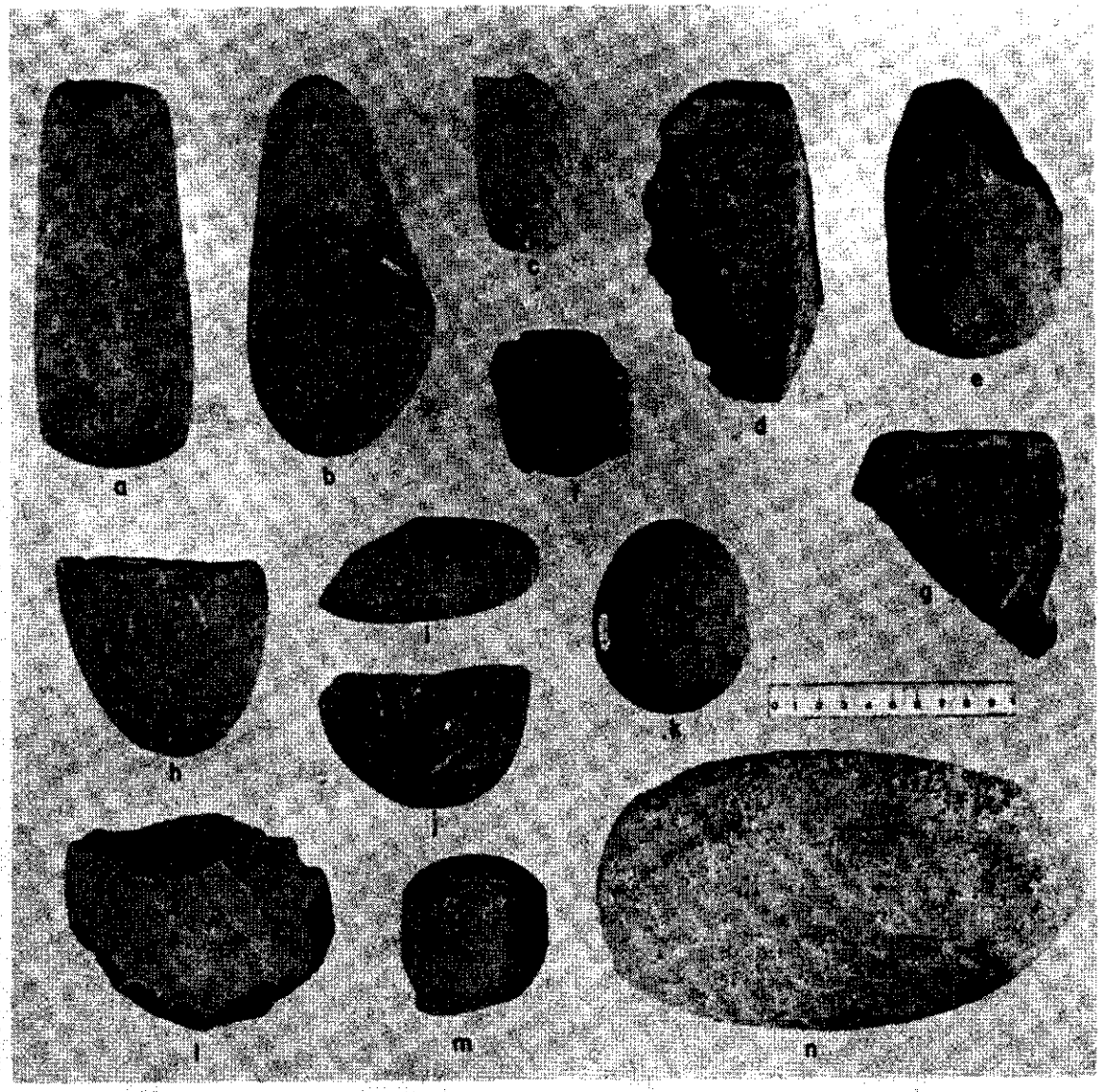
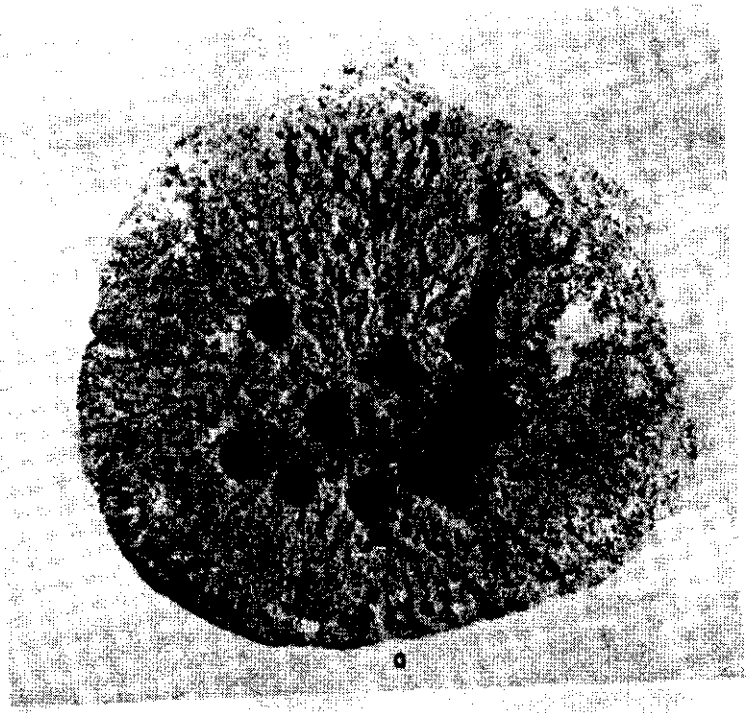

n
o
p
q
r
s
t
u
v
w
x
y
z
aa
bb
cc
dd
ee
ff
gg
hh
ii
jj
kk

PLATE 7




a

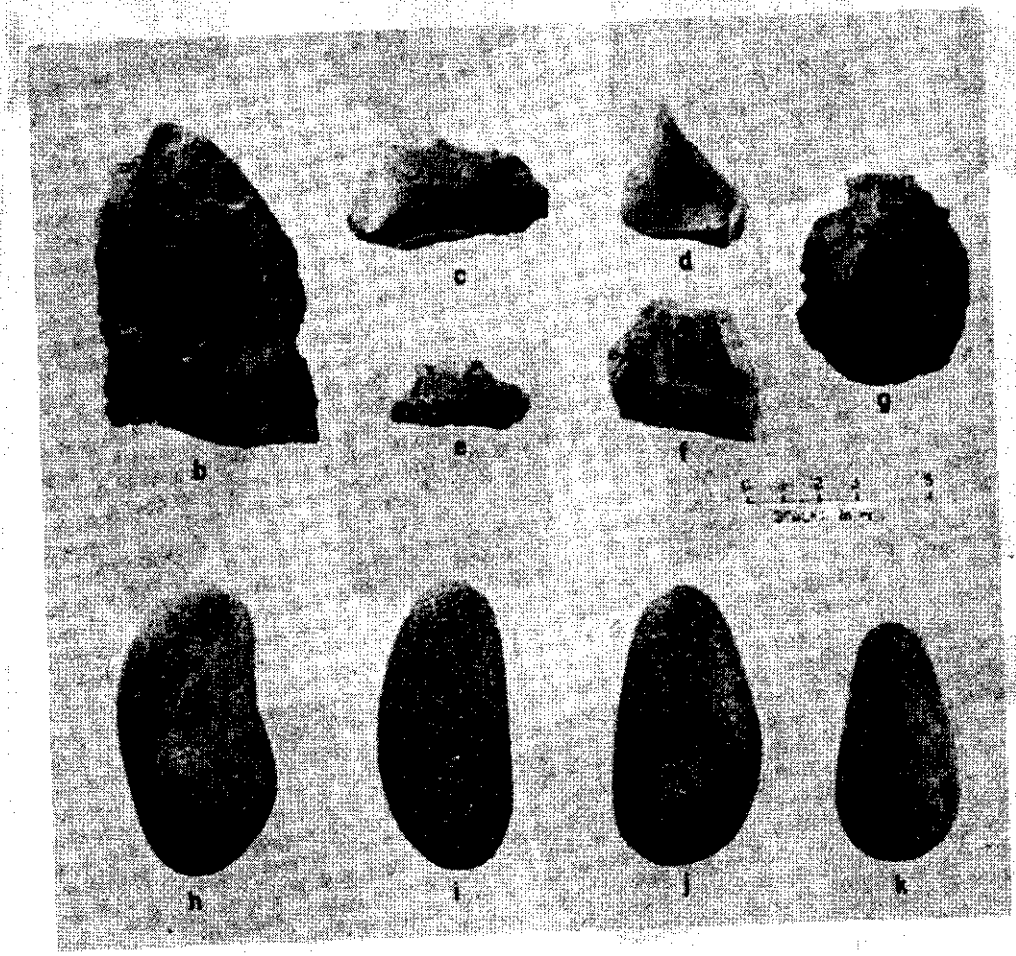

b
c
d
e
f
g
h
i
j
k

PLATE 9